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Case Studies Of Reading Performance Of Male Students And The Single-sex Classroom

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CASE STUDIES OF READING PERFORMANCE OF MALE STUDENTS AND THE SINGLE-SEX CLASSROOM

by

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ABSTRACT

Data from standardized test scores shows boys are falling further behind in literacy each year. Thanks to countless hours of research, we can pinpoint some of the causes for this decline. The major challenge educators face is how to keep boys interested in reading while placed in classrooms not necessarily designed to meet their needs.

One option being explored is the use of single-sex classrooms. For over 160 years in the United States, public school single-sex classrooms have existed. The thought is that by separating boys and girls for academic classes, certain distractions will be eliminated, the environment can be adapted to accommodate the needs of boys, and teachers can teach in a style more appropriate to the gender.

This study investigated how successful single-sex classrooms are in promoting student achievement. By taking data from the National Association for Single-Sex Public Education (NASSPE), and standardized test scores from selected states, the study looked at any statistical differences that occurred within schools containing academic, single-sex classrooms, and coeducational classrooms. Further, the study investigated whether significant differences occurred between gender groups within schools containing single-sex classrooms and those within coeducational ones. Finally, the study looked at presentation methods within these classes.

Findings of the study indicated that for single-sex classes to be effective, further research must occur in order to develop best-teaching practices applicable to each gender. The study also demonstrated the need for professional development opportunities for single-sex classroom teachers, as success in such classrooms was found to be possible

and demonstrable. Furthermore, the study indicated a need to identify students who would most benefit from inclusion in a single-sex classroom.

This dissertation is dedicated to my mother and father who inspired me to complete all things I begin and who have been the greatest examples any person could follow. Dad, I'm sorry you couldn't be here to see the "Big one."

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LIST OF ACRONYMS/ABBREVIATIONS

AR	Accelerated Reader
CARS	Center for Academic & Reading Skills Program
CAS	Cognitive Assessment System
CBM	Curriculum-Based Measurement
DSS	Developmental Scale Score
EIP	Early Intervention Program
GRT	Group Reading Test
HEW	Department of Health, Education, and Welfare
KHSAA	Kentucky High School Athletic Association
LD	Learning Disabilities
LDE	Louisiana Department of Education
LSI	Learning Style Inventory
MHSAA	Michigan High School Athletic Association
MSJHSC	Mid-Suburban Junior High School Conference
NAEP	National Assessment of Educational Progress
NASSPE	National Association for Single-Sex Public Education
NCAA	National Collegiate Athletic Association
NCLB	No Child Left Behind Act of 2001
OCR	Office of Civil Rights
OCRDOE	Office of Civil Rights of the Department of Education
PRT	Primary Reading Test
RSI	Reading Style Inventory

STAR	Standardized Testing and Reporting Test
STARS	Sensory Training Approach to Reading and Spelling
USDOE	United States Department of Education
WISC-R	Wechsler Intelligence Scale for Children-Revised

CHAPTER ONE: INTRODUCTION

The English philosopher Francis Bacon stated, "Reading maketh a full man, conference a ready man and writing an exact man" (Jokinen, 2006, quote 34). Data from the National Center for Education show many Americans are not full in Bacon's sense of the term. In 2005, the National Assessment of Educational Progress (NAEP) reported 39% of U.S. fourth-grade boys read below a 'basic level' and have little or no mastery of the knowledge of skills necessary to perform work at each level (Perie, Grigg, & Donahue, 2005). According to the United States Department of Education (USDOE), in 2005, boys are 50% more likely to be retained in elementary school than girls (Whitmire, 2006). The USDOE also reports that girls score 3% higher than boys on reading and 12% higher than boys on writing standardized tests (Tyre, 2006). Thanks to the requirements established in the *No Child Left behind Act of 2001*, schools become accountable for student progress with standardized testing in third grade. Lackluster results in the National Association for Educational Progress' (NAEP) assessment of reading from 2005 showed male and female students in both fourth and eighth grade have only achieved a 2% raise from scores in 1992 (Perie et al, 2005). In addition, there was no significant difference in both fourth and eighth grade at the basic level, and there was only a 2% raise for both grades at the proficient level (Perie et al, 2005). Statistics such as these show the growing challenges students face regarding reading in the intermediate and middle school years.

Many researchers believe the brain may hold the answers to improving achievement in reading. In recent years, the focus has turned increasingly toward the differences in male and female brains. For example, the size of the "language center" of

a boy brain is smaller than that of a girl brain (Strauss, 2005). This translates into a longer time period necessary to develop linguistics. According to Michael Gurian, a family therapist and author of many books regarding the gender gap, "The male brain is not set up to move material as quickly to words" (Graham & Hardy, 2006, ¶ 23). He also suggests that the problem can be associated with the fact that, "Teachers aren't trained to cope with kinetic boys' learning styles" (Graham & Hardy, 2006, ¶ 24).

Gurian cites differences in both boys' and girls' positron emission tomography (PET) and magnetic resonance imaging (MRI) (Gurian & Stevens, 2004). Girls have a larger bundle of tissues between hemispheres, which provides for better communication between the two sides. They have stronger neural connectors in the temporal lobe, providing for better listening capabilities and details in writing. The hippocampus of girls is larger, allowing for a larger memory storage area. The prefrontal cortex is more active and develops sooner than boys, allowing girls to resist impulsive decisions with greater ease (Gurian & Stevens, 2004).

The brain of a boy is different from that of a girl. For example, boys have more cortical areas, giving them the desire to be more mechanical by nature. According to Gurian, they have a desire to, "move objects through space, like balls, model airplanes, or just their arms and legs" (Gurian & Stevens, 2004, p. 23). Boys also have less serotonin, a chemical that aids in memory and emotions, and oxytocin, the main bonding chemical in the body (Gurian & Stevens, 2004). This means boys are more likely to desire movement within a classroom setting and a need to talk. The brain of a boy operates with less blood flow and is structured to compartmentalize learning (Gurian & Stevens, 2004). Thus, boys have a harder time multitasking and generally have a shorter attention span.

Finally, Gurian states boys' brains need a chance to fall into a neural rest state in order to recharge it (Gurian & Stevens, 2004).

Scientists have been able to trace the brain differences to development within the womb. According to Arthur Arnold, a physiological science professor from the University of California at Los Angeles (UCLA), it is when testosterone is first produced that the "exposure wires the brain differently" (Tyre, 2006, p. 48). This is speculated to happen within the first trimester, but scientists are still unsure exactly how this happens. This event also explains girls who were more apt to play with toys that are geared for boys, as their mothers produced high levels of testosterone during pregnancy (Tyre, 2006).

William Brozo, a literacy professor at the University of Tennessee and noted expert regarding boys' literacy, suggests an even deeper root to the problem boys face with reading. Brozo (2002) states,

> Regardless of what we might learn about male brain chemistry or understand about boys' behavior, we know they need special attention with respect to literacy. Dimensions of masculinity should be considered when developing reading curricula or designing activities to promote independent reading habits (p. 17).

Brozo calls for teachers to do more than just change what is offered to boys for reading. He states the need for mentoring and support as well as an exposure to many different types of literature (Brozo, 2002).

Besides the scientific reasons, boys tend to have a different mindset regarding reading. In a study from the University of Maryland, 105 fourth and fifth grade students (fifty-eight boys and forty-seven girls) were looked at to determine the amount they read as well as the variety of reading (Guthrie & Wigfield, 1997). Subjects were administered

an eighty-two item questionnaire, designed by the authors, "to assess different aspects of reading motivation" (Guthrie & Wigfield, 1997, p. 422). They were given this questionnaire at the beginning and end of the school year. It was broken into eleven aspects which included reading efficacy ("I can be successful at reading"), reading challenge (satisfaction in mastering complex reading topics), reading curiosity (desire to learn), reading involvement (enjoyment of the experience of reading different things), importance of reading, reading work avoidance (what students do not like about reading), competition in reading (desire to outperform others), recognition for reading (wanting something for the completion of a book), reading for grades, social reasons (so as to share the meaning of a story), and compliance.

Results can be divided into four groups. First, the aspects of children's motivation for reading in the fall indicated strong reliabilities for all groups towards challenge, curiosity, involvement, social reasons, competition, and compliance. This changed in the spring and challenge was eliminated. Factor analysis determined three factors: intrinsic aspects, extrinsic aspects, and a combination of competition and work avoidance (Guthrie & Wigfield, 1997). Second, the relationships of childrens' reading motivation to the range of their reading indicated a strong, positive correlation with efficacy, involvement, challenge, recognition, grades and social reasons. The results changed in the spring to favor curiosity, reading involvement, recognition, grades, efficacy, challenge, importance, and social reasons. From this, one can predict children's range of reading in the spring based on the fall (Guthrie & Wigfield, 1997). Third, the levels of reading motivation revealed high mean scores regarding grades and importance, and low mean scores regarding competition, social reasons, and work avoidance. This

means subjects favored intrinsic and extrinsic motivators over competition and work avoidance (Guthrie & Wigfield, 1997). Finally, grade, time, and gender differences in children's motivation for reading were addressed. In the fall of 1994, significant differences could be seen regarding grade in efficacy, recognition, and social reasons. Fourth graders outperformed fifth graders in all areas, and read more minutes per day. Gender differences could be seen in efficacy, importance, social reasons, and competition. Girls outperformed boys in all of these areas except competition. In the spring, only social reasons and competition recorded significant differences, still showing boys scoring higher only in competition. The authors suggest further research should be conducted to investigate why competition was the only significant difference in which boys outscored girls (Guthrie & Wigfield, 1997).

One of the largest resources to help promote the importance of reading with boys and to provide resources to aid in the challenges is a literacy program called "Guys Read." Created by Jon Scieszka in 2002, a parent, former educator and an author of children's books, the program provides books that appeal to boys as well as the promotion of men as role models (Bafile, 2005). The belief is that, "Once a boy gets hooked, it is easy to move him toward more sophisticated texts" (Merisuo-Strong, 2006, p. 114). Thanks to the Internet, the program is available on a larger scale (www.guysread.com). Not only does it contain book suggestions for boys who are beginning readers up to those who are advanced, but also links to authors, information about the program, and a limited amount of data regarding boys and reading. The site even has the necessary tools to start your own "Guys Read" program including printable posters, stickers, and bookmarks (Scieszka, 2005).

Regardless of how boys view reading, many researchers think changes in the school setting could provide the necessary catalyst to help boys and literacy. Michael Smith and Jeffrey Wilhelm, co-authors of the book *Reading Don't Fix No Chevys*, agree that schools are designed for girls and "Schools seem to be failing boys in literacy education" (Smith & Wilhelm, 2002, p. 3). They suggest changes to the entire learning process may be in order. The idea of social constructivism – changing the environment, methods, and expectations - may change the entire learning experience, and thus, change attitudes, behaviors, and how they learn. Both authors agree that by eliminating the usual distractions, the likelihood of learning taking place is greater (Smith & Wilhelm, 2002).

One option being looked at across the country is single-sex classrooms. According to the National Association for Single-Sex Public Education (NASSPE), these are defined as classes where boys and girls are separated for at least part of the school day (NASSPE, 2007). As of March, 2007, at least 262 public schools across the country offered some single-sex academic classes, and fifty-two public schools were completely single-sex (NASSPE, 2007)

Although the research on single-sex classrooms is still relatively new, the main reason for hesitation in the United States is decidedly not new. Title IX of the Educational Act of 1972 states, "No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance" (20 U.S.C. § 1681). This means that schools must offer the same educational opportunities to both sexes, or risk losing federal funding. For this reason, the creation of single-sex classrooms is challenging.

To help ease these misgivings, Congress has begun to enact new laws. In 2001, President George Bush signed into law the *No Child Left behind Act* (P. L. 107-110). One of the aspects of the law reinstated the Elementary and Secondary Act of 1965 (P.L. 89-10). This act allows for local agencies to try single-sex classrooms provided they follow the laws in place regarding discrimination. In response to this, changes to Title IX occurred on October 25, 2006 allowing schools to offer single-sex classes in academic core classes (Nondiscrimination on the Basis of Sex in Education Programs or Activities Receiving Federal Financial Assistance; Final Rule, 2006).

It is evident that more research is needed to see if single-sex classrooms provide an answer to the growing problems that boys face in the classroom. Although this may help some male students, it is important for educators to remember no one solution will work for every student.

Statement of Problem

According to national reports, 39% of boys at the fourth grade level are below the basic level in reading (Perie et al, 2005). This low performance is likely to lead to retention (Perie et al, 2005). As of January 2007, few studies explore the effectiveness of single-sex reading classes.

Significance of the Study

This study was performed to analyze the efficacy of single-sex classrooms towards male reading achievement. In addition, the study hoped to shed light on classroom teacher strategies as related to gender issues.

Purpose of the Study

This study investigated the success of single-sex education as compared to coeducational education. Specifically, it determined whether students who were in single-sex reading classes outperformed students in coeducational reading classes. Further, it looked at significant differences in scores by boys in single-sex classrooms and boys in coeducational classrooms. Finally, it detailed the strategies teachers are using within single-sex classrooms regarding reading. The results of this study provided useful information to the educational community regarding the effectiveness of single-sex classrooms as well as suggestions for improving their efficacy.

Research Questions

This study focused on the following questions:

1. To what extent is there a difference in reading proficiency regarding state standardized test scores in single-sex classes and scores in coeducational classes?
2. To what extent is there a difference in reading proficiency regarding state standardized test scores between boys in single-sex classes and boys in coeducational classes?
3. To what extent is there a difference in learning gains regarding reading between boys in single-sex classes and boys in coeducational classes?
4. Other than the gender structure, to what do teachers of single-sex and coeducational classes attribute the success of their students?

Hypotheses

The following hypotheses were tested:

1. There is a significant difference in reading proficiency regarding standardized state test scores in single-sex classes and scores in coeducational classes.
2. There is a significant difference in reading proficiency regarding state standardized test scores between boys in single-sex classes and boys in coeducational classes.
3. There is a significant difference regarding reading learning gains between boys in single-sex classes and boys in coeducational classes.
4. Teachers in successful classrooms, based on reading proficiency regarding state standardized test scores, are using best practices and unique techniques to teach students in their classes.

Methodology

Schools were selected from the list provided by the NASSPE. Each school was contacted via e-mail to reduce the number in the sample (Appendix A). The initial e-mail contained five qualifying questions that ask for information regarding in what grades single-sex classrooms were used, whether the single-sex classroom involved reading, if the single-sex classroom was offered to both boys and girls, what year the program began, and if a comparable coeducational classroom was offered. The e-mail was sent to the principal and he or she was instructed to fill out the survey if they were interested in participating in the research project. Those who did not respond were not included in the study.

The schools who responded favorably to these questions were sent a follow-up e-mail requesting the necessary data (Appendix B). In certain cases, data were acquired directly from the principal; in others, the data were received from the district office. Individual schools were asked to provide data regarding the state standardized test scores regarding reading for each grade containing male, single-sex classes and coeducational ones within the same grade. The data contained gender, the classroom setting they were in, and reading scores on the state standardized test. In all but one case, an indicator of whether learning gains were achieved was provided. Each individual school was analyzed as a separate case as all state tests are different.

Principals were then asked if teachers could be given a questionnaire (Appendix D) regarding teaching methods and professional development they have received regarding teaching methods. Once approval was given, each teacher from the accepted grade was sent the questionnaire via e-mail (Appendix C). The teachers were instructed to fill out the questionnaire, and send it back as an e-mail attachment (Each school was chosen as a potential candidate through the use of e-mail, so it was understood that each teacher had e-mail access as well.).

All data were analyzed using SPSS for Windows version 13.0. For research questions one through three, an independent t-test was performed on all three cases and a chi-square test of independence was performed on case two and three. For question four, each subject who chose to respond was initially involved in individual discussion. Following this, a summary of all responses was written to determine if commonalities existed.

Delimitation of the Study

The study was delimited to schools listed by the NASSPE as schools containing single-sex classes that were not entire single-sex schools.

Limitations of the Study

The study used schools containing single-sex classrooms as determined by a list generated in August 2007 by the National Association for Single-Sex Public Education (NASSPE) and confirmed by e-mail responses to a questionnaire by the principals of each school. Also, the study was limited to the data provided by the principal of the school or the school district, depending on the specific case. Finally, the study was also limited to those teachers who were willing to participate in the questionnaire. Any inferences should be drawn only after careful consideration of the data provided in each case.

Theoretical Framework

Research thus far has shown that it is important for schools to accept the fact that all students learn differently. With regards to gender, boys, in general, are more physically active learners. This being the case, it is evident Piaget's cognitive developmental theory should be applied when a single-sex classroom is being created. A Swiss cognitive theorist, Piaget believed that all people go through four stages of development (Berk, 2004). He emphasized the fact that people do not necessarily go through the stages at the same times, but they must go through all of them in order for cognitive development to truly take place.

The first stage, sensorimotor, occurs between the ages of birth and two years old. This is where, "Infants 'think' by acting on the world with their eyes, ears, hands, and mouth" (Berk, 2004, p. 19). This stage is where children develop the ability to learn through pulling levers, pushing buttons, and putting objects in their mouth. Also, it is here where students are unaware of the existence of objects when they can not be seen or heard (Berk, 2004). Next, children from ages two to seven experience the preoperational stage. Children begin to take what they learn in the sensorimotor stage and explain it using words. It is here where preschoolers will do things such as dress up and imitate things they see in their lives through play. Although they can express themselves, it is usually in an illogical fashion (Berk, 2004). Third, children from seven to eleven years old progress to the concrete operational stage. The child is now able to formulate the illogical thoughts they had in the preoperational stage into clearer, logical thoughts. They begin to understand that changing appearance does not necessarily mean an object's amount is different. Also, they begin to organize things so they can understand them (Berk, 2004). The final stage, which occurs from age eleven on, is the formal operational stage. This is when students accept and comprehend abstract ideas and can apply theory in order to solve problems. Such words as inference, depth, and perception can be associated with this stage.

The single-sex classroom can not just be a separation of boys and girls. When creating a single-sex classroom, it is crucial to understand that students are more than likely in different stages of cognitive development. The research has shown that boys and girls learn differently; however, the majority of boys rely more on aspects of the concrete-operational stage than the formal operational stage. For this reason, boys tend

to be more kinetic learners, and require movement throughout the learning environment. The creation of the single-sex classroom allows teachers to create a more conducive learning environment for boys. This ties in with the application of Piaget's theory regarding curriculum which states, "Educators must plan a developmentally appropriate curriculum that enhances their students' logical and conceptual growth" (On Purpose Associates, 1998, ¶ 8).

Summary

The goal of the No Child Left behind Act of 2001 is to have all students reading at their appropriate grade level. It is the responsibility of schools to find the most effective way to achieve this goal. This study showed that single-sex education may be an effective strategy toward the goal.

CHAPTER TWO: REVIEW OF LITERATURE

This chapter is divided into four sections: (1) learning styles, (2) the difference between boys and girls, (3) current trends in reading, and (4) the law. The researcher reported on research that addressed the different aspects associated with single-sex education. The belief was that single-sex classrooms would allow teachers to use teaching methods and strategies that have been proven to be most successful for each gender. By doing this, an increase in success with regards to reading would occur. This would be evident in a comparison between standardized test scores from schools using single-sex classrooms and schools only using the traditional coeducational method.

Learning Styles

A classic challenge for all teachers is teaching a class of students containing visual, auditory, and kinesthetic learners. The most prevalent of all, visual learners, make up approximately 65% of the population (Roark, 1998). These students may require an array of different methods involving colors and manipulatives to enhance retention (Roark, 1998). According to an article from the May 2006 Educational Leadership, "Neuroscientists are now confirming in the laboratory what the Egyptian, Buddhist, Mayan, Chinese, and medieval European illuminators knew all along: Colorful visuals are a powerful stimulus to learning" (Kirschenbaum, 2006, p. 48). Although this may translate into increased learning for all students, it may benefit visual learners the most.

A study performed in a South Dakota high school investigated the use of visuals to improve vocabulary retention (Rose, 2004). Fifty seniors and 75 freshmen were given a pretest to determine ability level. They were then given a weekly vocabulary list of 30

words to define. Initially, subjects created posters defining the words. These posters were hung around the room and removed prior to testing. As the weeks progressed, the amount of posters hung was reduced and an inclusion of posters into each student's notebook took place. The results showed a decrease in student performance by 25% regarding test scores as the posters were removed from the walls. When students were questioned about the posters, they said the posters were a good addition, but they were not studying the words. For this reason, the instructor began spending twenty minutes a day explaining, defining, and requiring the use of the words in an assortment of literal texts while continuing the use of the visuals. This adjustment caused a 20% increase in test scores, indicating the use of visuals for vocabulary enrichment must be accompanied by multiple methods of direct instruction in order to achieve true effectiveness (Rose).

Using visuals to enhance comprehension can help learning disabled students as well. In a study performed in New York City schools, an experimental group of 15 students entering the sixth grade who had been classified as having some type of reading disability were compared to a control group of 15 students who did not receive this classification (Ficarra, Larson, Shelley-Tremblay, Silverman, & Solan, 2003). Both the experimental and control group contained students who scored between one-half and one full standard deviation below the national average on the Gates-MacGinitie Reading Test, a standardized test administered nationally to measure reading ability (Ficarra et al., 2003). Both groups were also given the attention portion of the Das-Naglieri Cognitive Assessment System. This is a norm-referenced intelligence test which measures planning, attention, simultaneous processing, and successive processing (Das & Naglieri, 2006). Following this, the experimental group was given 12 one-hour computerized

attention therapy sessions over 12 successive weeks. Both groups were then retested using the CAS (Ficarra et al., 2003).

Results indicated the group receiving the therapy showed an increase in comprehension scores where the control group showed little or no improvements. Also, the data revealed two other important things. First, it reinforced the belief that attention skills are measurable. Second, it showed attention therapy can help improve attention as measured by the CAS attention battery. It is important to note this was the *second* study done by this group, and other studies would need to be performed as uncertainties still existed (Ficarra et al., 2003)

On the rare occasion we can identify a sample containing a majority of visual learners, the use of technology could be an important tool in the improvement of the educational process. In a study done in Melbourne, Australia, a test of students identified as visual learners was conducted to explore if a program called "MicroWorlds" would assist in increasing the quantity and quality of writing in subjects (Vincent, 2001). The program uses LOGO – a language created in the 1960's to, "Give control of the computer back to the children" (Vincent, 2001, p. 243). Since its original platform was developed, LOGO has morphed into a full multimedia interface (Vincent, 2001).

The sample consisted of four boys and two girls. All children were in the fifth grade and possessed similar characteristics with regards to ability. Five students who "strongly preferred visual learning style" and one student who "very strongly preferred verbal learning style" were used. Students were given the Wessler Intelligence Scale for Children. Learning styles were determined by level of mastery in each portion of the test. Subjects were accustomed to computer usage as each had access to notebook computers

within their original classroom. The students were exposed to three different types of writing assignments over a five week period while receiving direct language instruction. The first task gave students no visual aids and asked them to create a narrative; the second task involved a writing assignment following a dramatic stimulus. The final task required the use of MicroWorlds (Vincent, 2001).

The subjects showed an increase in scores from the first to the third assignment. Results of the first assignment were consistent with the subject's learning style grouping. The single subject who favored an auditory learning style did well regarding content. One of the students who favored a visual learning style produced a sample of 310 words; however the content and flow of the narrative was poor. In the second assignment, two of the six subjects chose to use MicroWorlds as opposed to another word processing program. All students showed an increase in scores; however those who chose MicroWorlds made greater gains. In the final task, all were required to use MicroWorlds at the same time. Only the auditory learner did not show gains, but the drop in scores was minimal. The technology played a major role in improving the length and content of the writing samples for the visual learners. Also, the boys showed a more evident improvement in writing than the girls. The author warns with such a small sample size, the data regarding gender and the results regarding length and content can only indicate the need for further research (Vincent, 2001).

Auditory learners retain information best by listening to stories and participating in discussions (Roark, 1998). When a teacher reads aloud in the classroom, it can help in creating a positive classroom environment, it allows students to hear different stories regardless of ability, it increase the amount of book exposure for a student, and hopefully

it encourages students to read on their own (Sharpe, 2001). Research indicates auditory learners make-up approximately 30% of the population (Roark, 1998).

A 2002 study investigated the effectiveness of teachers' reading aloud in the classroom by comparing three different styles of reading aloud (Brabham & Lynch-Brown, 2002). Interactional styles have the teacher reading and discussing the story simultaneously. Performance styles have the teacher reading the story in its entirety and encouraging discussion before and after the story. The just-read styles do not encourage discussion about the story at any point in the lesson. Fifteen groups of twelve students were randomly selected from twelve first-grade and twelve third-grade classrooms. The classrooms were chosen from five schools found in large school systems in the southeastern United States. From the fifteen classes in each grade, five groups were formed and randomly assigned one of the three reading aloud styles. All classes used the books *Call Me Ahnighito* by Pam Conrad and *Everglades* by Jean Craighead George. They were chosen "for their rich vocabulary, interesting information, and challenging concepts that first and third graders were not likely to have learned previously" (Brabham & Lynch-Brown, 2002, p. 467). Teachers were provided with a script for the introduction and purpose statements so all classes would have an identical starting point. Following this, each of the three groups was given a script to be read during the twenty minute session so as to maintain continuity within style groups (Brabham & Lynch-Brown, 2002).

Each teacher from the specified groups was directed to maintain the characteristics associated with the group. For example, teachers from the just-read group were told to read the story and allow for no discussion at any point. At the completion of

the story, students were given paper and asked to do a list of tasks without talking. Teachers from the other two style groups were given identical prompts and questions to, "stimulate discussions of story structure, facts, inferences, story concepts, and word meanings" (Brabham & Lynch-Brown, 2002, p. 467). All groups were given a pretest of forty vocabulary words found within the two books. Following the completion of the books, two twenty-question vocabulary tests were given, separating the vocabulary by book. Also, each group was given a seventeen question comprehension test (Brabham & Lynch-Brown, 2002).

Significant gains in vocabulary and comprehension were observed in both groups where discussion was encouraged. The just-read groups showed little or no gains regarding vocabulary and comprehension. This indicates a need for interaction while reading aloud. The author adds, "Additional research is needed to (a) determine whether the significant but inconsistent effects of styles on comprehension were procedural or statistical anomalies unique to this study and these books; (b) examine purposes and stances promoted by styles and their influence on comprehension; (c) see whether the pattern of effectiveness for different styles maintain and can be manipulated and applied to facilitate vocabulary acquisition across the elementary and secondary grades; and (d) explore qualities of interactions and discussions related to text and how they affect learning for students of different ability levels, for a variety of text types, and for different instructional purposes across subject areas and grades" (Brabham & Lynch-Brown, 2002, p. 472).

A detrimental characteristic auditory learners must face is being distracted by noise. Any sound can be considered noise (WordNet, 2007). Auditory learners,

especially those who have some form of learning disability, have extreme difficulty blocking out noise while reading. A study from Northwestern University investigated the effects of noise on sentence perception (Bradlow, Hayes & Kraus, 2003). An experimental group of 63 students (18 girls and 45 boys) classified with learning disabilities (LD) and a control group of 36 students (15 girls and 21 boys) who were not classified with LD were used (Bradlow et al., 2003).

Both groups were given four groups of sixteen sentences taken from the revised Bamford-Kowal-Bench Standard Sentence list. The sentences all contain three or four key words and are declarative (Bradlow et al., 2003). A man and a woman recorded the reading of the sentences in a conversational and a controlled, clear speaking situation. The conversational format allowed the reader to speak at a normal pace whereas the clear speaking format pace was slowed down as if they were speaking to non-English or hearing impaired subjects. Subjects were placed in a soundproof booth with an observer. A sentence was read over the loudspeaker in the booth and the subject was asked to repeat what they heard. Subjects were permitted to take the time needed; however, no sentence was repeated. The sound and decibels were controlled for all subjects. Following the first set of each type, the noise was raised from four to eight decibels. The observer kept a record of how many key words were repeated (Bradlow et al., 2003).

Males and females in the control group scored better in both conversational and clear formats. With regards to speakers, students scored higher with the female speaker in both groups. The only case where there was not a significant difference between the male and female speaker occurred in the conversational speaking at eight decibels. Finally, when the noise was increased, both the control and experimental group scored

lower in performance. These results reemphasize the importance of eliminating background noise while educating students with learning disabilities (Bradlow et al., 2003).

Kinesthetic learners make up approximately 5% of the population (Roark, 1998). They fully engulf themselves in the task at hand, are excited about their work, and enjoy computers and hands-on activities. With such a small percentage of the population being full kinesthetic learners, it is difficult to take only a kinesthetic approach to teaching. Integrating a kinesthetic method into a classroom, however, may enhance the learning process for all members of the class (Roark, 1998).

Kinesthetic learning may be the common bond in helping learners who struggle (Roark, 1998). In a study out of Georgia, learning styles of gifted achievers and underachievers were compared (Gerber, Rayneri, & Wiley, 2003). Sixty-two gifted sixth, seventh, and eighth graders were used. Sixteen of these students had a grade point of average (GPA) below 85 (out of 100) and were considered underachievers. This group was compared to the remaining 46 students who had a GPA of 90 or above (Gerber et al., 2003). Subjects were administered the Learning Style Inventory (LSI), an evaluation tool containing 40 Likert-type questions regarding physical environment, emotionality, sociological preferences, and physical needs. Responses were converted into T-scores by the test publishing company to indicate learning style preferences. These preferences were separated into categories including noise, tactile, visual, different forms of motivation, and others. Scores were then evaluated to determine general preferences for high and low achievers (Gerber et al., 2003).

Results indicated similarities with the two groups. Both groups preferred less lighting to assist in learning; however, the low performing group showed more of a need to have low lighting. Persistence was considerably more important to high achieving subjects. With regards to kinesthetic learning, both groups favored tactile learning. The low performing group showed a much greater need than the high achieving group (Gerber et al., 2003). These findings indicate teachers may not be using necessary strategies to provide the maximum amount of help for low performing students (Gerber et al., 2003).

The importance of kinesthetic methods can be seen in comparisons of regular education and students classified as requiring special needs as well. In a study out of Bermuda, 93 sixth graders were chosen and randomly placed into four homerooms by the assistant principal (Lister, 2005). The subjects represented the community from which they lived and had similar socioeconomic status. The sample was comprised of 61 students classified as regular education students and 32 students classified as below average students who required learning support (Lister, 2005). Subjects began by taking the LSI to determine their learning styles as well as the Semantic Differential Scale to determine student attitude toward learning. Subjects were then presented with a social studies unit regarding Christianity and Judaism separated into parts. For each part, a pretest and posttest (developed by the researcher) was administered. Parts A and C were taught using a traditional method and involved traditional homework. Part B was taught using tactile and kinesthetic methods and involved tactual and kinesthetic homework. Part D was taught using learning-style materials and involved tactile homework (Lister, 2005).

Results indicated the majority of students benefited from the integration of kinesthetic methods. A statistically significant increase in scores occurred between parts A and B. An even larger increase occurred between parts C and D. Conversely, a statistically significant difference occurred between parts B and C. The lowest scores came in part C (a traditional approach following a kinesthetic approach) whereas the highest scores occurred when a kinesthetic approach followed a traditional one. The data suggests students of all categories (both regular and special needs) should be taught using an array of methods, including a kinesthetic style, as opposed to only using traditional methods. These findings are in line with the research of others regarding the same type of study (Lister, 2005).

Challenges with reading may come from an environment rich in a specific learning style. In a study out of New Jersey, the breakdown of the modality students favor was analyzed (Geoghegan, 1996). The study involved forty (twenty of each gender) elementary students in basic skills reading classes as determined by teacher recommendation and completion of the Primary Observation Performance Rating Scale for grades one and two, and scores from the Iowa Test of Basic Skills for grades three to five. Subjects were administered Carbo's Reading Style Inventory (RSI) to determine whether auditory, visual, kinesthetic or tactual learning style was favored. Students in grades one and two were given one form of the RSI and had the questions read to them individually. Students in grades three to five were given another form of the test that provided them the chance to read the questions themselves, and had the questions read to them in groups. Following the test, all students were interviewed individually. Results were analyzed and favoring modalities were determined (Geoghegan, 1996).

The results revealed a significantly stronger favoring of the kinesthetic and tactile modalities than was expected by the researched percentages. This indicates the need for additional research to determine whether favoring the auditory and visual styles is the best method. On the surface, it appears using a mixed modality method to instruction would benefit even the students who strongly favor one learning style (Geoghegan, 1996).

Knowing teachers must combine learning styles to be highly effective is only half the story. The most difficult piece of the puzzle may be realizing which combination of learning styles will be the most effective. Birch and Belmont were two of the first to look at the effects of auditory-visual integration on reading success (Feldman, Futterweit, Jankowski, & Rose, 1999). Their work produced a highly accepted test to predict reading ability and intelligence.

The original study did have flaws. For example, there was a lack of intramodal controls, a necessary component in determining whether learning disabled children were having problems in one area or in cross-modal areas (Feldman et al., 1999). Another flaw involved the cross-modal transfer. Subjects jumped from temporal directly to spatial. This meant it was difficult to determine whether the problem involved the two separate functions or the transfer itself. Finally, the length of some of the test might have played a factor in performance (Feldman et al., 1999).

The design problems indicated a need for more studies to reinforce the original findings and to handle any flaws in the reasoning. In Scotland, 165 fifth-graders (81 boys and 84 girls) were given a similar auditory-visual test to see the relation of integration to intelligence and reading (Rae, 1977). Subjects came from four different primary schools

and all had normal hearing and vision. Subjects were given both a reading and a non-verbal intelligence test to use as a baseline. Following this, they were randomly put into groups and given a test similar to the one administered in the original study. Subjects were exposed to an audio stimuli followed immediately by a visual stimuli consisting of dot patterns. Timing and distance of the projector from the screen was kept constant. Score was determined by number of correct answers by the subject (Rae, 1977).

The test showed a significant correlation between reading and auditory-visual integration. This study was one of eleven at the time that reinforced the original Birch and Belmont findings, as well as one of seven that controlled for intelligence. The author indicates the importance of continual study, but reminds the reader the true issue is not if there is a correlation between auditory-visual integration, but at what age is the correlation the strongest (Rae, 1977).

One of the more recent studies involved 90 participants (50 who were born premature and 40 who went full-term) (Feldman et al., 1999). The subjects were between the ages of eleven to twelve and had been part of a prior study where they had been successfully tracked from seven months old to age six. All subjects had normal vision and hearing. The goal was to test the prior findings and correct the three flaws found with the original Birch and Belmont study. Subjects were categorized as either "poor" or "good" readers based on the Wechsler Intelligence Scale for Children-Revised (WISC-R) along with three tests of reading. To qualify for this study, students had to score average or above average on the WISC-R. Nine subjects from the original sample were eliminated due to this requirement. Once grouping (poor and good readers) occurred, subjects were given two temporal processing tasks. The first involved two patterns where

the subjects determined whether the patterns were the same. The patterns started as both auditory or both visual, and then progressed to cross-modal. They ranged from three to six tones or visuals containing set pauses. The subjects took the test on a computer and were prompted on the happenings. The second task involved a similar set of constraints; however, the patterns were comprised of three stimuli and had only one extended pause between sets. The main difference in the stimuli was in the positioning of the pause, not the mode being used (Feldman et al., 1999).

In task one, the results showed the expected separation in reading ability. Significance occurred in the complete auditory condition for the "good readers" group and the visual-auditory condition for the "poor readers" group. A test of covariance when controlling for memory revealed no significant changes in findings. In task two, the "good" group outperformed the "poor" group significantly for both accuracy and reaction time. The test of covariance controlling for memory revealed significance for response time and not accuracy. This indicates memory issues exist within groups regarding how fast subjects respond. Overall, the results indicate struggling readers will struggle regardless if you use spatial and temporal patterns (original study) or only temporal patterns. Unfortunately, no indication of time being a factor could be made from the present study (Feldman et al., 1999).

Combining all three learning styles may be the answer. Drama is a subject where using visual, auditory, and kinesthetic strategies is second nature. In an article from the *Reading Teacher,* Jennifer McMaster, a third grade teacher writes, "Drama is an invaluable tool for educators because it is one of the few vehicles of instruction that can support every aspect of literacy development. Drama encompasses all four of the

language arts modalities and is an effective medium for building decoding, vocabulary, syntactic, discourse, and metacognitive knowledge" (McMaster, 1998, p. 574). The author sites a study where fourth grade students are paired with kindergarten students to perform drama exercises (McMaster, 1998). Results from the study showed an increase in communication skills as well as a revitalized interest in reading. By incorporating a highly visual medium, the students showed better results in comprehension (McMaster, 1998).

A study out of Central Florida explored the use of readers' theater, a combination of instructional approaches to improve fluency (Corcoran & Davis, 2005). The sample consisted of 12 (three females, nine males) second and third grade students classified as either learning disabled or emotionally handicapped. The class was self-contained and combined the two grades. Subjects were grouped based on ability determined by an oral fluency test. One group was given plays considered above their reading level; the other two groups were given the same plays considered "on level". All groups were given a pre and post survey to determine the attitude of the subjects toward reading. The groups met together to go over basic drama techniques and to create a set of rules to follow regarding behavior and posture. Following the group sessions, students followed a schedule so as to keep them on task. The schedule included reading silently, reading aloud, modeling by the instructor, practice, and feedback. All performances were videotaped and reviewed by the students to see where improvements could be made for the next performance (Corcoran & Davis, 2005).

Results of the post survey indicated a 16% improvement in attitude toward reading. Some of the largest increases occurred when subjects were asked about reading

out loud and their enthusiasm regarding readers' theater. Also, students were asked to insert their favorite subject. Thirty-seven percent of those who participated in the post-survey included writer's theater as a favorite; no one included the class in the pre-survey. With regards to oral fluency, the number of words read out loud correctly increased an average of 17 words per minute. These results suggest the readers' theater program had a positive effect on reading improvement for lower level students (Corcoran & Davis, 2005).

Teaching to a class filled with different learning styles can be a challenge if the teacher favors a specific style. A study out of a southeastern university looked at learning styles of students studying to become elementary school teachers (Daane, C., Giesen, Judy & Sloan, Tina, 2004). A group of 72 subjects (66 female, 6 male) were given the Style Analysis Survey, a 110 question tool designed to identify learning and concentration preferences, as well as performance in both aspects. The test is broken up into five categories and Likert scale answers were provided (it is believed learning styles fall more on a continuum as opposed to a single number) (Daane et al., 2004).

The categories were evaluated individually. The first category, designed to show favoring learning style, indicated 31% favored visual, 7% favored auditory, 13% favored tactile, and 50% favored a combination of the three. When the combination was further categorized so only one of the three could be favored, 72% of the subjects favored visual learning, 50% tactile and 43% auditory. Category two, the piece determining introversion and extroversion, showed 61% of the subjects were extroverts, 18% were introverts and the remaining percentage were a combination of the two. Category three, a comparison of intuitive to concrete-sequential, showed an even split between the two

categories and the combination of the two. Category four, a comparison of closure and open orientation, showed a strong weighing toward closure. The final category, global versus analytic, showed a strong favoring toward global (Daane et al., 2004).

Regardless of one's learning style, modifications in the classroom are necessary to accommodate all learners. This may mean integrating the use of hands-on activities, playing quiet, classical music quietly during tests, or using an assortment of visual aids to help convey the message of a lesson. The need to continue studying the different learning styles as well as the styles students favor is crucial to help not only struggling learners, but all learners in general.

The Difference between Boys and Girls

For years, research has shown boys and girls learn differently regardless of where they live. How students learn to learn was investigated in a study from Hong Kong. A group of 59 boys and 64 girls from grade four and 96 boys and 97 girls from grade five participated in a survey dealing with self-concept of competence ("Are you satisfied with your academic results?"), self-concept of affect ("Do you like school?"), task orientation ("How much do you care about improvement and progress?"), effort orientation ("Are you willing to put in the effort to learn new things?"), broadening ("Do you like to read new books and explore new knowledge?"), flexibility ("Are you willing to try different problem-solving strategies?"), and independence ("do you search for information on your own and self-evaluate") (Yeung, 2003). Subjects responded to 24 Likert scale items.

Results showed boys scored lower in all categories, and the scores were significantly lower in all categories but competence and flexibility. This meant they wanted to be at school less than girls, they were not willing to explore in order to learn

new things, and they were more dependent on others regarding learning. Since all seven categories are considered crucial aspects of learning according to the Hong Kong government, a need for reform exists in order for boys to be successful in later years. These results were in line with results from the Education Department of Hong Kong regarding student achievement between primary and secondary schools. The author suggests the key to solving the problem lies in motivating students by gender. In other words, school officials must develop ways to motivate boys in a way so that they will respond positively and begin to shift the pendulum (Yeung, 2003).

The question still being argued is how boys and girls differ. The Hong Kong study showed the need to motivate boys so as to nurture growth. This mindset is crucial regarding reading as well. In a study from the University of Maryland, 105 fourth and fifth grade students (58 boys and 47 girls) were looked at to determine the amount they read as well as the variety of reading (Guthrie & Wigfield, 1997). Subjects were administered an 82 item questionnaire, designed by the authors, "to assess different aspects of reading motivation" (Guthrie & Wigfield, 1997, p. 422). They were given this questionnaire at the beginning and completion of the school year. It was broken into 11 aspects which included reading efficacy ("I can be successful at reading"), reading challenge (satisfaction in mastering complex reading topics), reading curiosity (desire to learn), reading involvement (enjoyment of the experience of reading different things), importance of reading, reading work avoidance (what students do not like about reading), competition in reading (desire to outperform others), recognition for reading (wanting something for the completion of a book), reading for grades, social reasons (so as to share the meaning of a story), and compliance.

Results can be divided into four groups. First, the aspects of children's motivation for reading in the fall indicated strong reliabilities for all groups towards challenge, curiosity, involvement, social, competition, and compliance. This changed in the spring and challenge was eliminated. Factor analysis created three factors: intrinsic aspects, extrinsic aspects, and a combination of competition and work avoidance (Guthrie & Wigfield, 1997). Second, the relations of children's reading motivation to the amount of breadth of their reading indicated a strong, positive correlation with efficacy, involvement, challenge, recognition, grades and social. The results changed in the spring to favor curiosity, involvement, recognition, grades, efficacy, challenge, importance, and social. From this, one can predict children's breadth of reading in the spring based on the fall (Guthrie & Wigfield, 1997). Third, the levels of reading motivation revealed high mean scores regarding grades and importance, and low mean scores regarding competition, social, and work avoidance. This means subjects favored intrinsic and extrinsic motivators over competition and work avoidance (Guthrie & Wigfield, 1997). Finally, grade, time, and gender differences in children's motivation for reading were addressed. In the fall, significant differences could be seen regarding grade in efficacy, recognition, and social. Fourth graders outperformed fifth graders in all areas, and read more minutes per day. Gender differences could be seen in efficacy, importance, social, and competition. Girls outperformed boys in all of these areas except competition. In the spring, only social and competition recorded significant differences, still showing boys scoring higher only in competition. The author suggests further research should be conducted to investigate why competition was the only significant difference where boys outscored girls (Guthrie & Wigfield, 1997).

Studies have shown that the challenges boys face regarding reading has existed since the 19th century (Strauss, 2005). Michael W. Smith and Jeffrey D. Wilhelm, authors of the book, *Reading Don't Fix No Chevys: Literacy in the Lives of Young Men*, attribute these challenges to such reasons as the trouble boys have with comprehension, the time it takes boys to learn how to read, and the amount that they read once they learn (McFann, 2004). Combine this with the statistic provided by the NAEP regarding boys who are reading below grade level, and it is evident there is a need to explore why a gap between girls and boys exists.

Scientists have been able to trace the brain differences to development within the womb. According to Arthur Arnold, a physiological science professor from UCLA, it is when testosterone is first produced that the "exposure wires the brain differently" (Tyre, 2006, p. 48). This is speculated to happen within the first trimester, but scientists are still unsure exactly how this happens. This event also explains girls who were more apt to play with toys that are geared for boys, as their mothers produced high levels of testosterone during pregnancy (Tyre, 2006).

Science is just one of the factors that adds to the challenges boys face with regards to reading. Peer pressure can squash a boy's love of reading instantly. Dr. Elizabeth Dutro, associate professor at the University of Colorado at Boulder, explains that certain books are labeled "Boy Books" and other "Girl Books." Also, W. G. Brozo, author of the book, *To Be A Boy, To Be A Reader: Engaging Teen and Preteen Boys in Active Literacy,* stresses that boys tend to tell other boys that reading is not cool (Merisuo-Storm, 2006). This is quite disheartening as boys in the United States are 50% more likely to be held back a year than girls and three to five more times likely to have a

learning disabilities placement (Merisuo-Storm, 2006). This peer pressure acts as a stepping stone to academic failure and discouragement.

Another factor associated with the challenges elementary students in general face is the exposure to different forms of medium. The NAEP reported 65% of fourth graders watch two hours or more of television and 21% watch six hours or more (Toppo, 2003). NAEP also reported the internet was a positive medium that does encourage reading, but it does not enhance their ability to read critically (Toppo, 2003).

Another possibility is that there might be problems with the most common tool being used to determine the level on which a student reads. A Curriculum-Based Measurement (CBM) is a system of assessment that demonstrates the progress that a student is making in reading. Different "probes" are given to determine if the instructional programs being used are effective (Expert, 2005). Although different versions of the system exist, they are all similar in design and content. Commonly, a CBM is used in special education classes. This is because they are easy to use and provide a snapshot of progress whenever needed (Expert, 2005).

In a study performed at the University of Florida in 1999, a CBM of reading was examined to determine whether racial, ethnic, and gender bias existed (Jordan, Kranzler, & Miller, 1999). This was only the second study performed regarding all three biases, and this was the first study done where bias was defined. The sample was comprised of 326 regular education students (76 of which were third-graders) from North Florida public elementary schools. The students were taken from grades two through five and contained 225 Caucasian and 79 African-American students. "Participants were administered six curriculum-based measures of reading fluency in one test session in

March as part of a school-wide CBM validity study" (Jordan et al., 1999, p. 7). The selections came from the textbooks being used. Each selection randomly chosen contained 250 words or more. The results showed no bias in the second and third grade levels. This suggests that using a CBM may be an unbiased method for determining the reading level of third graders (Jordan et al., 1999).

One of the most common schools of thought is that boys and girls choose different book genres when they are given options. In England, a study performed by Sainsbury and Schagen (2004) explored the attitudes students had towards reading. 5076 students in grades four and six were given a questionnaire in 1998 to determine general feelings regarding reading as well as what they preferred to read. The questionnaire was given again in 2003 in response to anomalies that occurred in the 2001 Progress in International Reading Literacy Study (PERILS). The PERILS study showed students from a similar age group performed well, but did not enjoy reading (Sainsbury & Schagen, 2004).

The study indicated a desire for boys to read more non-fiction based stories found in newspapers or informational books as opposed to girls who preferred stories and poems. A comparison of the two sets of surveys indicated little or no change in this factor. A drop in interest in reading was seen between the five years as well as between grades 4 and grades 6 in each of the survey years. From the data collected, it can not be determined why there is a decline in these areas. A suggestion for further research was given to determine the reasons for the declines as well as the reasons for the choices in readings by the subjects (Sainsbury & Schagen, 2004).

Studies similar to the 1998 study have been conducted in England for over 35 years. The *W. H. Smith Children's Reading Choices Project* looked at the achievement in reading, as well as the selections in genre of 10 to 14 year-old children (Coles & Hall, 2002). The study was initially performed in 1971, when the English School Council called for such a study. Frank Whitehead, a researcher from the University of Sheffield, through sponsorship from W H Smith, a bookstore company, administered a national written questionnaire to approximately 8000 subjects (4162 boys, 3797 girls) within the age group. This was followed up with face-to-face interviews of a subgroup of 576 students. The study was replicated in 1994 with approximately the same amount of subjects (4047 boys, 3824 girls) in the hopes to see if trends had changed over the 23 years (Coles & Hall, 2002).

Results indicated no significant difference in the amount being read by subjects. An increase could be seen in 10 year-olds as well as 12 year-old girls. No change occurred for 12 year-old boys and 14 year-old girls. The 14 year-old boys showed a decrease. An increase was recorded for the amount of periodicals and magazines being read by all groups as compared to the 1970's data. The most popular materials read according to boys were comics, tabloids, and soccer magazines. Overall, 83% read periodicals on a regular basis. Books, however, showed significant differences in the genre being read. The boys favored fantasy, science fiction, sports, and war stories. Girls favored romance, adventure, animal related, and horror/ghost books. Only 2.8% of the entire sample reported reading non-fiction exclusively; however, 78% of this subgroup was boys. This is concurrent with the idea boys favor non-fiction (Coles & Hall, 2002).

Two recommendations were made. First, schools need to realize boys and girls are challenged differently with regards to reading. The author places the responsibility of the school to challenge students based on their gender. Second, it is important for the schools to take the recent information and use it. In other words, teach using some of the practices they will experience when they leave the classroom each day. It is the responsibility of the teacher to explore how students are reading at home and in the community so the students can learn as they do when they are on their own. The author recognizes the importance of a structured curriculum, but this can be adjusted to better suit the students and to create an environment more conducive to success (Coles & Hall, 2002).

The work of Coles and Hall sparked additional studies regarding the choices in reading being made by students. In 1997, two studies out of Sheffield University in England were performed regarding magazines and comics (Marsh & Millard, 2001). In the first study, 255 subjects (134 boys, 121 girls), all 11 year-old, were given a questionnaire at the end of primary school as well as the beginning of secondary school which explored interests in comics and magazines (Marsh & Millard, 2001). The results indicated boys were more likely to read comics than girls. The data also showed both groups were not as interested in the violent or suggestive comics. This information reinforced the need to perform another study looking at the effectiveness of sending home more familiar texts for students to read (Marsh & Millard, 2001).

The second study took younger students who stated they had read comics on a regular basis and provided them a home-school library of comic books to read. Sixty-nine students (35 boys, 34 girls) from year one and year three were chosen. Researchers

chose younger students as many studies up until this point focused on older students. Subjects were permitted to check out one comic per week for a half-term. Upon completion, students were interviewed and asked the same questions appropriately worded to the age group (Marsh & Millard, 2001).

Results indicated both boys and girls preferred taking comics as opposed to books. Ninety percent said comics were easier to read, and over half said the pictures helped them read the words. Although many enjoyed the comics, only 28% said reading comics would foster a greater interest in reading. It is important to note no significant difference was seen regarding gender. The results suggest a potential for the inclusion of comics as an alternative, but it is warned that the family environment will play a large role in the effectiveness of the tool. The data indicates materials from pop culture help cultivate an interest in reading; however, the author states further research is needed to determine the effectiveness of sending home materials from pop culture as supplements (Marsh & Millard, 2001).

The prior studies have indicated the attraction boys have to both non-fiction and comic books. The problems boys face as measured by standardized tests may not be in the boys, but in the test itself. In a study performed at the University of Iowa, test scores from students in grades four to eight were reviewed to see if the types of reading comprehension questions may play a role in student performance (Barron & Bray, 2004). 19,735 students from Iowa schools who take the Iowa Test of Basic Skills (ITBS) were used. Subjects were given between nine and 11 "try out units" obtained from the 1998 and 1999 ITBS tryouts. Each passage varied in size, and was accompanied by six to 19 comprehension questions. Following each unit, students were asked a Likert question

regarding the interest in the topic. A random selection of one passage per student was performed, creating approximately 200 students per passage that was used (Barron & Bray, 2004).

Results indicated a decline by grade in interest. In grade four, girls recorded a significantly higher score regarding interest. Following grade four, no significant difference could be seen by gender. Also, the interest scores varied more for boys at all grades, although the variance was not significant. There was no consistent relationship and comprehension between passages once verbal ability was controlled. A slight overall positive correlation could be seen between gender and comprehension under the same conditions. With regards to predictors, the data suggests comprehension can be predicted by gender, verbal ability, and interest (Barron & Bray, 2004).

The author suggests the need for further studies in a few areas. First, the results regarding gender and the interest-comprehension relationship should be further investigated, as it was in line with previous studies using shorter reading passages. Second, the author states, "Interest is a stronger predictor of comprehension for relatively interesting passages than for relatively uninteresting ones" (Barron & Bray, 2004, p. 124). More research is needed to strengthen this data, as it could necessitate a revamping of the test questions to create greater equity within the test (Barron & Bray, 2004).

Another common difference in boys and girls regarding achievement in reading deals with the maturity of comprehension skills. In a study out of Finland, 2,891 sixth-graders and 1,953 ninth-graders were studied to measure depth of comprehension (Hautamäki, Kupiainen, Lehto, & Scheinin, 2001). The study was a follow up to the International Association for the Evaluation of Educational Achievement study

performed in 1970-1971 and again in 1990-1993. This was a 30 country study designed to investigate reading comprehension skills. In both of the previous studies, Finnish students performed well and showed improvements in reading skills between studies; however, students, "appeared to have difficulties with such reading tasks as required higher cognitive processing: e.g. inference, the selection of meaningful information or the evaluation of information" (Hautamäki et al., 2001, p. 100). The present study investigated these challenges as well as any differences in gender and relationships regarding comprehension and academic achievement (Hautamäki et al., 2001).

A hierarchy-ratings test containing three passages was used. The first passage, given to both grades, was a 279-word passage regarding US history. This was done so comparisons between grades could be made. Sixth graders were given a second passage, containing 316 words, comparing Indonesia and South Korea. Ninth graders received a 624-word magazine article from Scientific American regarding remote controlled helicopters used to gather intelligence. The final passage for sixth graders contained 475 words and dealt with "biodiversity in the world" (Hautamäki et al., 2001, p. 103). For ninth graders, a 567-word passage regarding memory research was given. All of the passages were taken from previously printed materials except for the article on memory research. Each article was given to students individually, along with 16 statements where the student was asked to, "Identify by statement number, first the two 'topic' statements and then the six 'main point' statements" (Hautamäki et al., 2001, p. 103).

Along with the hierarchy-rating test, two other evaluation methods were used. First, a multiple-choice reading comprehension test containing three shorter passages and four to six multiple-choice questions per passage was given to all students. Along with

this, the academic achievement of the students was used. The data were collected from both grades and the four to ten (four being a failing grade) grading scale was maintained. Students were administered the multiple-choice portion first, then the hierarchy-rating test (Hautamäki et al., 2001).

Girls outperformed boys in all of the tests, regardless of grade. The hierarchy-rating test showed no interaction effect regarding grade and gender, where as a slightly significant interaction effect was recorded regarding the multiple-choice test for the same two groups. A significant correlation between the hierarchy-rating test and academic achievement could be seen. Also, reading comprehension improved with grade, and was related to school achievement. The author states, "The large number of successful interventions proves that – once identified – poor reading comprehension can be improved through education" (Hautamäki et al., 2001, p. 108).

Does self-esteem play a role in achievement? In a study out of England, year six students were given the Primary Reading Test (PRT), the National Federation for Educational Research Mathematics eleven test, and the Lawseq questionnaire (a tool designed to measure self-esteem) to see if a relationship exists between gender and achievement when including self-esteem (Brember & Davies, 1999). The classes were randomly selected within one Local Education Authority and the data were collected over eight years. Each of the years was divided into cohorts so as to delineate between years. A total of 1488 students (737 boys, 752 girls) were used (Brember & Davies, 1999).

Overall, boys scored higher regarding self-esteem. Only one cohort had girls posting a slightly higher mean score than boys (difference of 0.1). The overall difference was significant at the 1% level as confirmed through a two-way ANOVA and the use of

harmonic means. This is in line with the majority of past research (Brember & Davies, 1999). Boys also outperformed girls with regards to math scores. When separated by cohorts, however, boys had higher means in four of the eight cohorts. The boys did post greater differences in the cohorts where they excelled. Overall, a two-way ANOVA showed a significant difference at the 5% level regarding gender when sex and cohort were used as the independent variables and standardized math scores were used as the dependent variable. Girls excelled in comprehension. When separated by cohort, girls were only better in four of the eight years. A two-way ANOVA showed no significant difference regarding gender. Also, no significant difference could be seen when separated by cohort (Brember & Davies, 1999).

Brember and Davies point out when self-esteem is correlated with all of the tests, the coefficients generated were significant. All of these findings are in line with prior studies. Interestingly, national data has girls outperforming boys in all areas. The conflict in results can be associated with the fact that the PRT was designed to "Minimize differences of achievement between girls and boys" (Brember & Davies, 1999, p. 12). Both the national and standardized tests were of the same design (short, timed, and written). The author suggests teachers measure self-esteem levels of students and use these findings when designing lessons (Brember & Davies, 1999).

The importance of devoting time for reading and writing every day has been recognized since 1998 in England. *The Literacy Hour* is a one hour session of every day for primary year students (National Literacy Trust, 2006). It is the product of the National Literacy Project, a 1996-1997 program created by the British government, "To raise standards of literacy in line with national expectations for primary schools by

improving the quality of teaching through more focused literacy instruction and effective classroom management; and by improving the school's management of literacy through target-setting linked to systematic planning and monitoring and evaluation" (National Literacy Trust, 2006, ¶ 1). It begins with the teacher explaining the objectives of the lesson and working with the entire class on the same story or writing example for approximately fifteen minutes. This gives the teacher the opportunity to model proper methods to the group. Next, students are given the opportunity to focus on words and sentences for fifteen minutes. Following this, the next twenty minutes are devoted to group work. This is important as it gives the teacher a chance to circulate around the room and focus on individual reading-level groups while the rest of the class is still being constructive. The final ten minutes involves a plenary session – an opportunity to review what they know with each other. The belief is a lower level of stress occurs when peers are explaining what they learned to each other as opposed to the instructor (Barrow, 2006).

Results were mixed. In 2002, 75% of the students taking the "Stage two tests" (a test to determine ability level) scored a level four or higher with regards to reading (Hopkins, 2002). Improvements were also seen in the stage one test. With regards to writing, however, only slight gains could be seen over the time period (Hopkins, 2002).

It is evident that the Literacy Hour has had great success overall. Does this success hold true when separated by gender? A small study of the program was performed by Helen Fisher, a primary year's teacher (Fisher, 2001). She won the Stanley Segal award for the study she performed with her students in 2000. The study looked at how students view the program, as well as the needs they had regarding reading success.

The results came from responses to a questionnaire given to 30 students in year four regarding the Literacy Hour. The questions dealt with how to arrange the lessons, likes and dislikes, the effectiveness of the program, their favorite activity in school, and what they like to do when they are not in school (Fisher, 2001).

Results were in line with prior research done regarding reading and gender differences. When asked about how to structure lessons, boys gave suggestions lasting no longer than twenty minutes each. The girls felt more time should be given to certain aspects of the program – especially the time allotted for writing. Along with this, both boys and girls were most comfortable when goals were clearly defined, but kept short. The general feeling was that too much time was being spent on explaining and introduction. Also, boys favored independent work to group time. The girls appeared dependent on the teacher when they are challenged and need assistance; however, boys embraced the challenges and sited, "I like Independent Work so I can use my brain" (Fisher, 2001, p. 31). This does not mean boys did not like working in groups; the feeling was a smaller group of four was more effective as noise was reduced and the amount of suggestions were limited. Finally, both sexes opposed having to read aloud and present their work (Fisher, 2001).

One of the most interesting results comes with the choices boys and girls made regarding genre. Using this small group, more boys chose poetry than girls, where more girls chose historical books than boys. The boys also suggested the program opened the eyes to different types of genre than they would normally experience. Although sample numbers were small, the expectation set by prior research were different to the one found in this study.

The importance of reading achievement was studied in Canada as well. A study of data from 187 students (87 boys, 100 girls) over a six year period (first through sixth grade) was used (Maynard, Norris, Osmond, & Phillips, 2002). The goal was to track progress in reading, as well to observe gender differences regarding reading over the same time period. The study followed prior studies from C. Juel (1988) and S. S. Smith (1997), researchers who used less students, single schools, tracking over a shorter time period, and less focus on gender differences. The current study looks at the distribution of boys in girls based on reading level, the probability of maintaining high reading levels over the six year period, and the probability of raising achievement levels over the six years (Maynard et al., 2002).

Students were taught using a national reading program and were tested using the Gates-MacGinitie reading tests. This is a test of both vocabulary and comprehension, and is used to determine skill level as well as to evaluate instructional programs. It is administered in May, and lasts approximately one hour. Scores were converted to z-scores and grouped into below average, average, and above average. This allowed researchers to compare scores for students from year to year, compare scores by gender, and calculate frequencies (Maynard et al., 2002).

Results in reading achievement showed an increase in the percentage of students falling into the "below average" category from grades one to four. Following grade four, the percentage falls. The amount of students in the "average" category fluctuated between grades, averaging between 62% and 71% for boys and 69% and 77% for girls. In the "above average" category, the highest percentage of boys was 16% in both grades

three and five. This is the same as the lowest percentage of girls in the same category. Overall, the girls outperformed boys in all six years (Maynard et al., 2002).

The probabilities of changing groups by sixth grade provided interesting outcomes. By sixth grade, boys had a higher probability of going from "average" to "above average", and a lower probability of falling to "below average" than girls. The girls did show a greater chance of maintaining "above average", and showed a better chance of improvement out of the "below average" category. The data indicates "average" boys have a slightly better chance of improving their reading ability from grades one to six. The author sites a need for further research of younger students regarding reading. This comes from the data showing students overall decreased in reading skills as they got older (Maynard et al., 2002).

In the United States, researchers have begun to address the issues associated with predicting reading and writing challenges in younger students. In a study out of the Midwest, student readiness scores from 281 subjects entering kindergarten were observed to see if they could be used as predictors for fourth grade achievement (Kurdek & Sinclair, 2001). The study addressed four issues associated with the use of readiness scores as predictors. First, most readiness scores cover the same topics. Second, scores from the readiness tests have been linked only to student performance at the completion of first grade. Third, questions exist whether readiness skills in a particular area are somehow connected to specific achievement in mathematics and reading. Finally, the issue of variations by age and gender may exist (Kurdek & Sinclair, 2001).

Subjects were given the Kindergarten Diagnostic Instrument as the entry exam. The test looked at an array of skills including auditory memory, concept mastery, gross

motor skills, number skills, verbal association, visual memory, and vocabulary. In the fourth grade, students were administered the Ohio proficiency-based assessments. This test included 11 areas including problem solving, number relations, geometry, algebra, data analysis, and concept skills (Kurdek & Sinclair, 2001).

Results of the comparison regarding age and gender were consistent with past studies. Younger children scored lower in verbal and visuomotor skills than older students. Boys scored lower than girls in visuomotor and reading achievement. When the interaction effect between age and gender was observed, no significant results occurred. According to the author, "The link between age and both school readiness and academic achievement was the same for boys and girls" (Kurdek & Sinclair, 2001, p. 453).

When looking at the differences between the two tests, unique variability could only be seen with verbal skills when looking at later reading achievement. In an attempt to predict reading and math scores, a combination of age, verbal skills, and visuomotor skills were used. Results showed when controlling for age, the same unique variability occurred. This occurrence, however, was not significant. This unique variability was seen in auditory variability for overall reading achievement (Kurdek & Sinclair, 2001).

Results from the Midwest study were similar to previous studies. Girls in the younger grades outperformed boys. Interestingly, fourth graders showed no significant difference with regards to gender. The results also showed a link between the readiness scores and later achievement. This means it is more important to prepare students with instructions as early as possible instead of worrying about their chronological age. The

better prepared to learn they are, the better chance they have at success regarding reading (Kurdek & Sinclair, 2001).

Regardless of location in the world, it is evident that a need for change in teaching methods regarding gender and reading exists. The research has been performed to show differences exist between boys and girls whether you are looking at learning styles, reading, or writing. Many studies have recommended a continuance with the research; however, some have taken the data and begun to change.

Current Trends in Reading

Schools around the world have taken an array of measures to help all students raise achievement. The Scottish government has created the Early Intervention Program (EIP) – a program designed to, "Raise standards of literacy and numeracy in the first two years of primary school with an emphasis on overcoming disadvantage and inequality" (Croxford, 1999, p. 2). The program was first presented in 1996, and the government gave each province in Scotland the freedom to embrace the program however they choose. One location, Aberdeen City, chose to introduce EIP in equal phases over three years so all primary schools in the city would have the program. One of the first challenges to overcome dealt with baseline data. Not all schools collected baseline data in a uniform fashion. For the purposes of EIP, the Performance Indicators in Primary Schools (PIPS) was used. The data showed those who entered school from lower socioeconomic areas performed lower on the baseline test (Croxford, 1999).

Results indicated that gender came into play during P1 – the primary stage of education. At the start of P1, boys and girls were equal. At the completion of P1, boys were over a full point behind girls regarding reading prior to the introduction of EIP.

Girls continued to score significantly higher than boys regarding reading, but both groups showed increases of more than four points. The author stresseed further research is needed to see if the gender differences can be overcome (Croxford, 1999).

One program being used in countries around the world including England, Scotland, and the Unites States involves the integration of technology. Accelerated Reader (AR) is a program designed to not help with reading comprehension, but also allow the student to perform a self-assessment of reading ability and provides feedback to both the student and the teacher (Evans, Topping, & Vollands, 1999). The program gives students the opportunity to choose from over 13,000 of all different ability levels. Once the book is completed, they are given a series of computerized multiple choice questions to see how well the book was understood. Students are not limited to books they have read alone; teachers may elect to allow students to test on books read as a class to see if comprehension is being accomplished in group settings as well. The hope is by providing continuous feedback, students will be motivated to read more, thus improving comprehension (Evans et al., 1999).

The success of AR has been studied globally since its inception. In Aberdeen, Scotland, two elementary schools were given the program with a limited amount of titles to choose from (Evans et al., 1999). The goal was to test the effectiveness with students who not only were from low socio-economic households, but also who had reading challenges including having special learning needs and are learning English as a second language. In the first school, 27 students (sixth graders) in a mixed ability classroom used AR for six months in a Macintosh format. Students were given a standardized score test as well as two different reading age tests. Their scores were compared to a control

group comprised of 12 students of similar ability who were not exposed to AR. The entire experimental and control group was used for the standardized score; however, a random sample from the AR group (12 students for the pre-test, 11 students for the post-test) was used to compare reading-age scores so as to maintain a balance in sample size (Evans et al., 1999).

Results indicated an increase in both the experimental and control group regarding the standardized test scores. The AR group showed a statistically significant increase, where the control group did not. No gender differences could be seen. The control group showed a decrease in both the Neale test of Oral Reading Accuracy and Neale test of Reading Comprehension (measures reading age). This decrease was significant in the reading comprehension test. The AR group showed a statistically significant increase for oral accuracy, but showed a decrease in comprehension ability that was not significant. To determine reading attitude, two different surveys were used with both groups. The AR group showed a larger improvement in attitude. Also, gender differences were apparent in AR groups. The girls showed a significantly better attitude than boys in both the pre and post tests (Evans et al., 1999).

The second school used another mixed ability class (sixth grade) as the experimental group, and a fifth grade control group. Twenty-four sixth graders (14 boys, 10 girls) had a poor ability level to begin with as compared to the 26 fifth graders who had a good ability level. AR was only used with the experimental group, was in an IBM platform, and was used for a six month period. Results were similar to the first school. The standardized tests showed statistically significant gains in both groups; however, the control group showed a greater improvement between pre and post tests. Once again, no

gender differences could be seen in the standardized test. A sample of 11 from the AR group and 12 from the control group were used for the reading age tests. Unlike in the first school, both groups showed increases in the oral accuracy test. A statistically significant increase was seen in the comprehension test for the AR group, where a slight decrease still occurred in the control group. Girls from both groups still had better attitudes than boys in the post-test; however, this was not true in the pre-tests (Evans et al., 1999).

Flaws were evident in the conditions of the study. First, students did not have an ample amount of low-level books to use. Second, students did not take time in reading some of the books, which resulted in poor test scores and lower pass-rate percentages than predicted by AR. Third, in the second school, the groups could not be created to compare to the first school, so alternative methods were used. Although these conditions existed, it is evident that the use of AR has the potential to help struggling readers improve (Evans et al., 1999).

In England, a larger scale test was performed to see the effectiveness of AR. Students aged seven to 14 from 13 schools were used (Fisher & Topping, 2003). This study follows one performed by Topping and Sanders in 2000 using over 62,000 US students. Students were administered the PRT and the GRT based on grade level. Both are multiple-choice, paper tests designed to test reading achievement. Students were also given STAR Reading - a computer-based, multiple-choice, norm-referenced test. All three tests were comparable to the tests given within the AR program (Fisher & Topping, 2003).

Results indicated pupils "progressed in tested reading skills at greater than normal rates" (Fisher & Topping, 2003, p. 274). Regarding gender, boys outperformed girls on the paper tests, but girls performed better on STAR. As expected, those who used AR appeared to outperform those who did not. The author suggests the need for further research regarding AR as this study did not take into consideration how the program was implemented in each school (Fisher & Topping, 2003).

The United States Government has one of the largest campaigns to help students learn how to read by the third grade. The *Reading First* initiative, a section of NCLB, provides over a billion dollars in grant funding each year to states for this cause (USDOE, 2005). These grants are awarded for professional development, materials, screening tools and reading programs provided they have been scientifically proven to be successful. By requiring the data to support the funding, the hope is that the money will be used on something that will prove effective. Once the funding is in place, the schools have the responsibility of choosing a reading program that is effective (USDOE, 2005).

One such program, direct instruction, has been used since the first one-room school house was opened. This model is where the teacher stands in front of the class and reads, or has the students read aloud. In recent years, the question of the effectiveness of direct instruction has been raised. In a three year study performed out of the University of Wisconsin, the direct instruction method was examined (Burton, Ryder & Silberg, 2006). Four types of instruction, varying in how much a teacher directed the instruction, were examined. The study examined students from two public school districts in the Milwaukee area. Six of the seven schools participated in the study for three years, and the other school participated in two of the three years. The Franklin

Public Schools students in the study were 86% Caucasian (10% on free and reduced lunch), whereas the Milwaukee public school students were 98% African American (95% on free and reduced lunch). Although the study began with 224 subjects, it ended with only 80 subjects thanks to, "student mobility, incomplete and invalid tests, and schools having changed student identification numbers between academic years" (Burton et al., 2006, p. 182). Subjects were given the Gates-MacGintie Reading Tests, first to create a baseline and then to show progress. The study revealed that although direct instruction is effective, it may limit the occurrences for excelling in reading, especially in the area of phonics (Burton et al., 2006).

The Read Well program, a primary reading program designed to provide the enhanced instruction necessary to help students who have fallen behind in reading, is another option available to teachers. In a study performed in the northeastern United States, seven first, second and third grade students from two elementary schools were used (Choutka et al., 2004). These students were identified as at-risk students because they were not making progress in reading. Of the seven, five students had been previously identified as having learning disabilities. The study was performed to determine whether the program could be initiated without much modification, and if it would work together with approaches already being used (Choutka et al., 2004).

The subjects were introduced to the program and asked to perform a set of tasks. While the baseline was determined, the subjects were only praised for completing the task. Next, subjects were instructed following the Read Well program and they received between 20 and 40 minutes a lesson, four days a week. All but two subjects followed the program for seven weeks. The results indicated there was success in the utilization of the

program with regards to passage fluency. When observing the success, the administrators of the study warned that the amount of subjects along with the fact that the success was seen when the program was given to subjects individually should be considered (Choutka et al., 2004).

Theme Scheme, a program designed to help primary aged students look beyond the plot of a story, is another program being offered to reduce the gap. In a study performed in New York City public schools, the theme scheme method was evaluated (Williams, 2005). The subjects were 120 students from inclusion classes in Harlem, taken from five, second and third grade classes. The students were randomly assigned to either a theme scheme class or a comparative class that used a program involved in the traditional vocabulary and plot method. Both groups received the same stories and the same amount of instruction (Williams, 2005).

Results showed four main outcomes. First, the theme scheme group understood the stories better than the traditional group. Second, they understood specific themes better. Third, the theme scheme group was superior in *near* transfer (In other words, they could explain the themes in a posttest containing stories not seen prior to the test). Finally, the theme scheme group did not transfer their knowledge to novels. This can be associated to the problems that primary-age students have with abstract thinking. Overall, the study indicated that at risk students would benefit from an integrated approach such as theme scheme (Williams, 2005).

Readers' Theater is a method that incorporates plays, speeches, and poems in the hopes of improving reading skills as well as fluency. The purpose is to increase interest in reading by directly immersing students who are normally not motivated to read in the

story (Corcoran & Davis, 2005). In a study out of Stetson University, twelve students from a self-contained exceptional education class were exposed to the Readers' Theater program (Corcoran & Davis, 2005). The subjects, students from a public school in Central Florida, were all classified as either emotionally handicapped or as having some learning disability. The class was taught by a first year teacher trained in reading recovery. Students in the study were separated into three groups based on ability. One group was given a play that was considered above their ability, where the other two groups were given the same play that was considered on level. Each group was given a ten to thirty minute session and approximately two weeks to practice the play. All three groups met together at the start and received smaller lessons from the researcher. The subjects learned the basics necessary to perform a play. Also, the students created rules designed to create an atmosphere conducive to learning. All subjects followed a schedule and the second and third performances were videotaped (Corcoran & Davis, 2005).

Subjects were given a pre and post survey to determine if their comfort levels in reading increased. The results showed that all groups increased in comfort levels. Students not only felt more comfortable reading the material, but also in reading out loud. Also, the survey involved students jumped from Mathematics to Reading as their favorite subject. Following the survey, a fluency test was administered. The test revealed an increase by all students in correctly read words as well as speed of reading (Corcoran & Davis, 2005).

Reading initiatives are not limited to just the classroom. Starting in 1997, newspaper journalists from the Baltimore Sun initiated a five year program called *Reading by 9*, as a response to NCLB (Matthews, 2005). The multifaceted program helps

teachers, students, and families. For teachers, the Sun provided over 600,000 newspapers for the classroom. For parents, two columns designed to promote reading and give advice were included in the weekly Sunday paper. For students, the Sun provided an array of incentive programs that recognized students who embraced and excelled at reading, along with a weekly column in the Wednesday paper just for kids ("The reading by 9 vision & program," 2006). The program was expanded in 1998 to include the Los Angeles Area through the Los Angeles Times, a sister company of the sun. Their program includes book donations and events as well as what the Baltimore version provided ("Reading by 9," 2006).

One of the largest resources to help promote the importance of reading with boys and to provide resources to aid in the challenges is a literacy program called *Guys Read* (Bafile, 2005). Created by Jon Scieszka in 2002, a parent, former educator and an author of children's books, the program provides books that appeal to boys as well as the promotion of men as role models (Bafile, 2005). The belief is that, "Once a boy gets 'hooked,' it is easy to move him toward more sophisticated texts" (Merisuo-Storm, 2006, p. 114).

Thanks to the Internet, the program is available on a larger scale (www.guysread.com). Not only does it contain book suggestions for boys who are beginning readers up to those who are advanced, but also links to authors, information about the program, and a limited amount of data regarding boys and reading. The site even has the necessary tools to start your own "Guys Read" program including printable posters, stickers, and bookmarks (Scieszka, 2005).

It is evident that despite efforts across the United States and around the world, students are still struggling to reach proficiency regarding reading. It is the responsibility of school officials to continue to monitor research regarding reading achievement to ensure all data-supported methods are being explored. By using methods such as the ones stated above, as well as single-sex classrooms, students will have the tools necessary to reach the goal of proficiency.

The Law

Single-sex classrooms may help raise student achievement; however, laws are currently in place that may prevent their existence. Brown v, the Board of Education (1955) helped the country to see equality in schools did not truly exist. Cases like this contributed to the creation of Title VI of the Civil Rights Act of 1964, which states, "No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance" (20 U.S.C. § 1681, 1972). Title VI covers all forms of discrimination; however, it does not address gender discrimination specifically.

One of the precursor cases for the creation of such a law was Kirstein v. Rector and visitors of the University of Virginia (1969/1970). Mrs. Jo Anne Kirstein, Miss Virginia Anne Scott, Miss Nancy L. Anderson, and Mrs. Nancy Jaffe, along with the United States National Student Association, sued the University of Virginia saying they were unfairly kept from admission to the college. Prior to the case, the University of Virginia was an all-male school thanks to Virginia state law, which had prohibited women from attending the college. It was determined Title VI of the Civil Rights Act

prohibited this action, as the school was receiving federal money. It was determined the all-male school would have to accept women in equal proportion to men. This action came full-circle in 1970, when the first woman was accepted to the school (USDOE, 1997).

Another case regarding non-contact athletics involved two high school girls in Ann Arbor, Michigan who wanted to participate at the varsity level in tennis for their high school. Morris v. Michigan State Board of Education (1972, 1973) addresses the rights of women to participate on all male teams as the female equivalent were not available. The Michigan High School Athletic Association (MHSAA) had adopted a policy which states, "Girls are not to engage in interscholastic athletic contests when part or all of the membership of one or both of the competing teams is composed of boys" (Morris v. Michigan State Board of Education, ¶ 2). The girls were suing, stating the rule was contradictory to the rights afforded to them in the Fourteenth Amendment.

The district court ruled in favor of the plaintiffs, recognizing the violation of the constitutional rights of the girls. The appellant court confirmed the decision of the district court; however, it did so with reservations. Although the rule created by the MHSAA was unconstitutional in its present form, the court was clear to state the main issue dealt with contact and non-contact sports. The sport in question, tennis, was non-contact. There was no question regarding the safety and well-being of its participants. Therefore, the case was returned to the district court so the word "non-contact" could be added and the injunction could be granted (Morris v. Michigan State Board of Education).

To address the problem of gender equity in the schools, the Department of Health, Education, and welfare (HEW) created Title IX of the Educational Amendments of 1972. It states, "No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance" (20 U.S.C. § 1681, 1972). This means that schools must offer the same educational opportunities to both sexes, or risk losing federal funding.

Over the next 25 years, Title IX went through changes in order to give it the strength it has today. In May of 1974, Senator Tower introduced an amendment to eliminate revenue producing sports from those required for compliance. When arguing this amendment, a letter from the president of the University of Nebraska was introduced, questioning the desire of women to participate in sports (The MARGARET Fund of NWLC, 2005). This amendment was rejected.

HEW published the original version of Title IX in June of 1974. The response was overwhelming; over 10,000 comments were received regarding the amendment (Curtis & Grant, 2006). In July of the same year, as a response to the comments, Senator Javits introduced an amendment requiring HEW to create regulations that included, "with respect to intercollegiate athletic activities, reasonable provisions considering the nature of particular sports" (Curtis & Grant, 2006, ¶ 3, col. 2). This was enacted and included into the law.

The Javits amendment sparked thousands of complaints regarding Title IX compliance as well. The Office for Civil Rights received complaints from the University of Michigan, the University of Wisconsin, and the University of Minnesota-Twin Cities

(MARGARET fund, 2005). Although it was evident such a law would mean an enormous amount of investigations, HEW presented the updated version of the bill containing the inclusion of the Javits Amendment to President Gerald Ford on May 27, 1975. Congress was given until July 21, 1975 to argue the amendment and disapprove parts or all of it. Although attempts to dissolve the changes as well as the entire amendment were made, the attempts failed and the amendment became law. Elementary schools were given one year, and secondary schools and colleges were given three years to come in compliance with the law in accordance to the regulations created by HEW (MARGARET fund, 2005).

While Title IX was being finished, court cases continued to arise regarding gender equity. In November of 1974, Brenda Clinton, a twelve year old girl from Cleveland, sued John Nagy, the Commissioner of the Division of Recreation of the City of Cleveland (Clinton v. Nagy, 1974). Miss Clinton had shown interest in playing football for the 97th Street Bulldogs, a recreational team in Cleveland. Her parents had filled out all necessary paperwork and the coach was ready to take her on the team. On the day of the first game, she was pulled from the team by Charles Hall, the director of Class "F" Muny League Teams, and was told that she was not eligible to play as she was a female. The parents went so far as to sign an additional waiver of liability no other player was required to sign, yet she was pulled from the team each of the following Saturdays prior to the start of the game. Miss Clinton's claim was the action violated her Constitutional rights and her hope was to receive a temporary injunction against the league so she would be permitted to play in the final two games of the season (Clinton v. Nagy, 1974).

The district court granted the injunction. The plaintiffs stated the case was related to Morris v. Michigan State Board of Education. The defendants challenged this as the Morris case dealt with non-contact sports. The defendants also argued the Ohio High School Athletic Association had the same rule regarding contact sports. Also, they used the testimony of two medical experts regarding the dangers of contact sports as well as the different growth patterns of boys and girls at this age. The court recognized the relationship to the Morris case and stated there was no evidence showing girls had a greater chance of getting hurt, or would sustain different and more severe injuries than boys of the same age. Interestingly, the ruling was to grant the injunction, but it was noted the injunction did not ensure she would play – it only granted her the opportunity to qualify to play. The decision of playtime was still in the hands of the coach (Clinton v. Nagy, 1974).

Even after the law was enacted, many educational institutions did not fully comply. Nine years after the Kirstein case, the U.S. Supreme Court heard the case of Cannon v. the University of Chicago (1979). Geraldine Cannon, a thirty-nine-year-old woman, alleged the University of Chicago did not accept her to the school because she was female. According to Title IX, this was illegal as the school was receiving federal funding. In the original case, the school admitted to the act. The question brought by the school was whether private action could be brought for a Title IX case. Prior to this, Cort v. Ash (1975) established whether a law could be privately enforced. In order for this to occur, it must be confirmed that the plaintiff is a member of the group the law was established for, there is legal history to show legal intent to create or deny private action, the creation of the private right of action will help the legislation, and the right addresses

a concern of the United States (Cort v. Ash, 1975). In the lower courts, it was determined the private action could not be brought as Title IX did not specifically allow for it. The U.S. Supreme Court overturned the ruling, stating private action was appropriate based on the four qualifications created by Cort v. Ash (Cannon v. University of Chicago, 1979).

In 1979, after much debate, President Carter signed the bill to create the United States Department of Education (USDOE) as part of an effort to streamline the Federal government (Stallings, 2002). At the same time, the governing body over Title IX compliance was changed from HEW to the Office of Civil Rights of the Department of Education. Once the change was made, the OCRDOE published a Title IX manual designed to use as a guideline for compliance (MARGARET funds, 2005). This manual includes a key component designed to determine whether a school is in compliance. "The three-pronged test" states three checks in which schools must be in compliance with at least one of the parts. First, the percentages of participants in athletics at a school must be proportionate to the percentage of enrollment for the gender in question. Second, the school must show a history and a continuing practice of adding sports for that gender. Third, the school must effectively accommodate the athletic interest and abilities of that gender ("Title IX at 30", 2002).

In 1980, the parents of Karen O'Connor, an eleven-year-old student from Illinois, sued the school board because she was not permitted to try out for the boy's basketball team (O'Connor v. Board of Education of School District 23, 1980). The McArthur Junior High School sixth-grader had successfully competed with boys for the four years prior on organized teams. She had been seen by a professional basketball coach and was

rated at a level higher than her grade. The school was a member of the Mid-Suburban Junior High School Conference (MSJHSC). The MSJHSC had a rule stating girls and boys could compete in coed sports, provided they were non-contact ones. Contact sports were defined as "Boxing, wrestling, rugby, ice hockey, football, basketball, and other sports the purpose of major activity of which involves bodily contact" (O'Connor v. Board of Education of School District 23, 1980, ¶ 9).

In the lower courts, it was determined the girl should be allowed to try out for the team for two reasons. First, the question of separate but equal was addressed. It was determined by forcing her to play on the girl's team, it was not providing her the opportunity to compete at a suitable level, thus creating a "separate, but not equal" situation. Second, the conference stated by allowing her to play on a boy's team would mean that boys would be allowed to play on girl's teams if they chose to try out. The fear was the creation of an imbalance of power on the girl's team, thus reducing the amount of girls participating in sports. The court stated there were insufficient options available to alleviate the situation (O'Connor v. Board of Education of School District 23, 1980).

Although O'Connor won at the district level, the court of appeals granted a stay to keep the girl from trying out. When the case came to the Supreme Court, the question of Title IX compliance arose. Title IX was created to protect against gender discrimination; however, it does contain regulations to protect the health and well being of the participants. It states:

> [A] recipient may operate or sponsor separate teams for members of each sex where selection for such teams is based upon competitive skill or the activity involved is a contact sport. However, where a recipient operates or sponsors a team in a particular sport for members of one sex but operates or sponsors no such team for members of the other sex, and athletic opportunities for members of that sex have previously been limited, members of the excluded sex must be allowed

> to try-out for the team offered unless the sport involved is a contact sport. For the purposes of this part, contact sports include boxing, wrestling, rugby, ice hockey, football, basketball and other sports the purpose of major activity of which involves bodily contact (O'Connor v. Board of Education of School District 23, 1980).

For this reason, the Supreme Court did not vacate the stay and the girl could not try out.

In 1979, court cases arose questioning whether Title IX could be applied to employment. In a combined case, Brunswick School Board v. Califano and Islesboro School Committee v. Califano (1978, 1979) involved School districts suing because their Federal funding was pulled due to Title IX non-compliance. The question dealt with women who were employed in non-teaching roles within the school boards, and pregnancy leave. The school boards did not treat the leave as a disability, and were cited for it. HEW also removed Federal funding in accordance to Title IX compliance. The district court determined HEW had no grounds to remove Federal funding and, in a sense, potentially injured the educational opportunities of the students within the districts. The United States Court of Appeals looked only at the plain language of the statute. This meant only teachers were covered under Title IX, as they were considered participants in a federally-funded program. Although the move violated other laws, the courts ruled it did not fall under Title IX as the positions were not funded by a federal program (Brunswick School Board v. Califano and Islesboro School Committee v. Califano, 1978).

In May of 1982, the case of North Haven Board of Education v. Bell (1981, 1982), addressed the connection of Title IX and employment as well. The North Haven, Connecticut, Board of Education sued the United States Department of Education contesting Title IX regulations. The board held that the regulations were never intended

for employment. In the lower courts, the decision favored the plaintiff, citing Title IX was never intended for employment. Not only was the board not required to adhere to the regulations, but they were freed of any loss of federal funding (North Haven Board of Education v. Bell, 1981).

The United States Court of Appeals overturned the decision. The United States Supreme Court agreed Title IX did pertain to employment. Although the law does not specifically speak of equal employment, it does imply employment as a requirement of the regulations. Also, Title VII of the Civil Rights Act of 1964 and the Equal Pay for Equal Work Act both cover gender discrimination with regards to employment. Title IX, however, covers whether Federal funding could be terminated if a violation of the regulations occurred (North Haven Board of Education v. Bell, 1981).

In 1984, the OCR took a severe blow regarding athletics. In Grove City College v. Bell (1984), Grove City College is a private college not receiving any direct federal funding. The only financial tie to the federal government can be found in the Basic Educational Opportunity Grants students were receiving. The USDOE determined which students were eligible, placed the amount to cover the grants in the college's budget, and allowed the college to disburse the funds through the Alternative Disbursement System. They stated the school was not in compliance with Title IX regulations and stopped funding the program. Four of the students from the college together with the college sued the USDOE stating Title IX regulations did not have to be adhered to as the college as an entity was not receiving funds (Grove City College v. Bell, 1984).

At the district level, it was decided the students could not lose funding because the school was not in compliance. In the appellant court, the decision was overturned,

and the students lost their funding. When the United States Supreme Court heard the case, it was determined the appellant court was wrong in its interpretation of the Title IX regulations. More importantly, the Supreme Court determined Title IX could not be applied to any program that does not receive federal funding directly. This meant Title IX could no longer be applied to athletics as no athletic program in the country received federal funding. Now the OCR only had limited jurisdiction over athletic program (Grove City College v. Bell, 1984).

The Grove City decision was a major setback, but the OCR was determined to press on. In 1987, they published the "Title IX Grievance Procedures: An Introductory Manual (MARGARET fund, 2005)." This was a set of guidelines, designed for schools, in order to fully notify them of their obligations for compliance. Along with this, the OCR clearly established a process for filing Title IX complaints, as well as creating a position in the USDOE to handle compliance (MARGARET fund, 2005). In 1988, Congress passed the Civil Rights Restoration Act in response to the Grove City College v. Bell decision ("Title IX: Chronology of controversy," n.d.). This legislation, which overrode a veto from President Reagan, overturned the decision of Grove City College v. Bell and "mandates that all educational institutions which receive any type of Federal financial assistance, whether direct or indirect, be bound by Title IX legislation (Curtis & Grant, 2006)." This means athletics were once again covered under Title IX. Two years later, the OCR created an updated version of the manual for investigators (Good Sports, Inc, n.d.).

The 1990's brought a great deal of awareness regarding Title IX. The heightened awareness led to a string of court cases which helped shape the law into its modern form.

In Franklin v. Gwinnett County Public Schools (1991,1992), Christine Franklin, a high school student from Gwinnett County, Georgia, sued the school board alleging sexual harassment by a male teacher. In her complaint she says she was continually harassed (including coerced intercourse), teachers and administrators were aware of the ongoings and did nothing to rectify the situation, and the school ended the investigation when the teacher resigned with the understanding the investigation would end if he did. Ms. Franklin was looking for damages due to the intentional action by the school district (Franklin v. Gwinnett County Public Schools, 1991).

At the district level, the case was dismissed citing Title IX did not allow for the reward of punitive damages to the victim, regardless of if the action was intentional. When the case went to the United States court of Appeals (11th circuit), the decision was confirmed. At the United States Supreme Court, however, the decision was overturned, citing an implied notion that punitive damages could be tied to Title IX. The decision was based on a combination of different issues. First, Cannon v. the University of Chicago (1979), allowed for private action to be taken regarding Title IX. Second, the history of the case showed negligence on the part of the school board. Third, the Civil Rights Remedies Equalization Amendment of 1986 stated, "remedies (including remedies both at law and in equity) are available for such a violation to the same extent as such remedies are available for such a violation in the suit against any public or private entity other than a state (Cullers, 1995)." Along with this, the Civil Rights Restoration Act of 1987 "broadened the scope of coverage afforded to Title IX (Cullers, 1995)."

In November of 1992, female students from Indiana University of Pennsylvania sued the school because the amount of varsity athletics teams was reduced (Favia v.

Indiana University of Pennsylvania, 1992). The claim was that the school had reduced the number of opportunities for women to participate in varsity level athletics. The plaintiffs also sited the numbers were not proportionate to that of the undergraduate population (the elimination of the sports resulted in a 17% difference between participation in athletics and enrollment to the school). The hope was to restore the teams as well as the funding and services they received as a varsity sport (Favia v. Indiana University of Pennsylvania, 1992).

The college claimed the reason for the reduction was merely one of budget. The defendants attempted to show a reduction in interest for the sports being eliminated. The decision to eliminate the particular sports was performed by an all-male panel. Also, the belief was that by eliminating an equal number of male and female teams, it would not disturb the balance in the school and put the school in compliance with the regulations of Title IX. The school further said that the gymnastics program would eventually be replaced with a female soccer team – a program gaining popularity around the country. The district court determined the school should reinstate the female programs, as well as return the programs to their original form due to the fact that the school was not in compliance of any prong of the three-part test. Also, although the inclusion of the soccer team would have helped correct percentages, it would not have corrected the amount of money being put toward female athletics. The appellant court affirmed the findings of the district court (Favia v. Indiana University of Pennsylvania, 1992).

In December of 1992, a similar case involving budget cuts arose. Amy Cohen and a group of female students from Brown University sued the college stating discrimination with regards to athletics (Cohen v. Brown University, 1993). The

members of the gymnastics and volleyball teams claimed the school was, "undermining their ability to compete in intercollegiate athletics and relegated the members of those teams to "second class" status (Cohen v. Brown University, 1993)." For the twenty years prior, the school had held both sports at the full varsity status. Now, the school moved the teams, along with men's golf and water polo teams to "intercollegiate club" status.

The school claimed the cut was made to accommodate the budget cuts needed over the next several years. The college allowed the four teams to participate provided they raised the necessary funds to operate. They would be permitted to participate in the same amount of events as in the past, would be eligible for post-season play, and had to follow the same rules set by the Ivy League as the recognized varsity sports. On the surface, it appeared the only change was the source of funding. A further investigation revealed the four teams were not receiving the same benefits as the recognized teams. Benefits such as preferred practice times, access to athletic trainers, freshman recruitment privileges, and office space for coaching staff was removed (Cohen v. Brown University, 1993).

The district court judge favored with the plaintiffs. It ordered Brown to reinstate the female sports to varsity status, and essentially return all aspects of the two programs back to the original form. At the appeal (1993), the court determined the district court was well within its right to issue the preliminary injunction. It did bring up the question of whether Title IX was enacted to increase participation by women, or reduce the amount of male sports so the numbers of participants match up. Although the case appeared to be decided, it was only granted a temporary injunction, returned back to the

district court for continued proceedings, and would resurface following further legislation (Cohen v. Brown University, 1993).

In February of 1993, a group of women from Colorado State University sued the college to not only get the softball program reinstated, but to also get damages for their action of removing the team (Roberts v. Colorado State University, 1993). The damages included a restoration of equipment and reinstating of scholarships. At the district level, the judge was careful to address all three prongs of the test. First, it was noted the percentages at the university were over 10% off. Even with the inclusion of the softball program, the percentages would be off; however it would help the school to get much closer to the goal of "substantially proportionate." The school contested by cutting baseball and softball, it increased the proportionality issue. They also argued "there was no set ratio that constitutes 'substantially proportionate' or that, when not met, results in a disparity or a violation (Roberts v. Colorado State University, 1993)."

The court suggested there was no evidence of the school showing continual expansion regarding female athletics. It was noted that the trend across the country had been a lack of increase in opportunities for women, but this was no excuse for not meeting the expectation. The school claimed a history of increase, as they had no varsity athletic offerings to women in 1970, and now offered eight. The court felt the present information was insubstantial to show the increase in sports was an actual trend, as well as any intention of continuing the expansion (Roberts v. Colorado State University, 1993).

The final prong, dealing with providing ample opportunities for true competition at the varsity level in a manner equal to those of the males, caused a great deal of

controversy. The plaintiffs contested they had spent entire lifetimes preparing, practicing, and competing in softball so they could play at the college level. Some of the girls stated they had chosen to attend the school so they could play for Colorado State. These girls turned down offers at other schools, and their opportunities for success in the sport had been jeopardized by the school. The courts determined there was a substantial increase in the sport. Also, they determined the school was truly not meeting the athletic needs of the women's programs, and had hindered future growth in women's sports at the school by eliminating programs (Roberts v. Colorado State University, 1993).

The Tenth Circuit Court of Appeals returned with a mixed decision. Although the court agreed with a majority of the decisions made at the district level, it disagreed with some of the requirements made by the court, as well as the way in which the requirements were to be carried out. It was determined the lower court should not have the power to determine exactly how the school would come in compliance. It was recognized Title IX compliance could have been achieved in many ways. The district court mandated that the school reinstate the softball program as the only option for compliance, essentially exceeding its authority. The appellant court did find the lower court had the right to set clear guidelines for the reinstatement of the team; however, they had no right to demand things not already in place such as a fall exhibition season (Roberts v. Colorado State University, 1993).

Roberts v. Colorado State University was just one of the many court cases regarding the reinstatement of programs. Cook v. Colgate (1993) involved the male and female ice hockey teams. The male team was considered a varsity sport where as the female team was considered a club sport. Once again, Title IX compliance was in

question, as the varsity teams received preferential treatment and benefits, as well as more competitive opponents (Cook v. Colgate, 1993). The main difference between this case and the Cohen v. Brown University case was that all of the plaintiffs of the suit would have graduated and would not have been eligible to participate in the sport.

The district court judge determined Colgate had been unfairly keeping the female ice hockey team as a club sport, as the team petitioned for varsity status in the years 1979, 1983, 1986, and 1988. He ordered the sport be made a varsity sport for the upcoming season, as well as for the school to provide comparable treatment as other varsity sports. At the appeal, the court returned the case to the district court and gave instructions to dismiss as moot because the decision to make the team a varsity sport would no longer affect any of the plaintiffs. If the plaintiffs had been representatives of the entire team as opposed to individual plaintiffs, then the court would have ruled differently (Cook v. Colgate, 1993).

The question of whether Title IX truly protects against discrimination for males regarding athletics has been challenged many times as well. One example of this came in 1994 when fourteen-year-old John Williams, a ninth grader from Bethlehem, Pennsylvania, wanted to try out for the girl's field hockey team (Williams v. The School District of Bethlehem, Pennsylvania, 1993). Mr. Williams had played coed intramural field hockey in eighth grade, and was interested in continuing play. He was rated an average player, and earned a position as goalie for the girl's team. He and one other boy had earned positions on the team, but were removed by school officials before they could play a match. The parents of Mr. Williams filed suit in the hopes of obtaining a permanent injunction so John could play. The two sides agreed to allow him to practice

while the trial was decided, but he could not play in games (Williams v. School District of Bethlehem, 1993).

The district court judge granted the injunction, citing the school was in violation of Title IX regulations. It was made clear that the only reason the boy was not permitted to play was because he was a male on a female team. The judge also determined field hockey was not a contact sport. The appeals court overturned the decision. Once again, the idea of field hockey as a contact sport was questioned. Although expert witnesses were presented to argue both sides, it was determined the sport was not truly a contact sport (Williams v. School District of Bethlehem, 1993).

The even larger question was whether athletic opportunities have been limited for boys throughout history at the school. The district court used the idea that girls have had more opportunities to try out for boy's teams than boys for girl's teams. The appellant court determined it was improper to use "try outs" as the key factor to tip the scales in one direction. In actuality, there were an equal number of teams for both sexes, and any opportunity for one sex to play on a single-sex team of the opposite sex was a rare exception. For this reason, the case was overturned and the boys were removed from the team (Williams v. School District of Bethlehem, 1993).

Another example of male discrimination in sports came in 1994. All members of the University of Illinois men's swim team sued the college because the school was eliminating the program (Kelley v. University of Illinois, 1994). The district courts determined the school had the right to eliminate the program in order to achieve compliance. The school was faced with a $600,000 deficit in the athletic program, so they decided to use a seven-part checklist to determine what sports to keep. The checklist

looked at whether the sport had a Big Ten and an NCAA championship, the history of success in the sport, the level of interest and participation at the high school level, how the school was equipped to fulfill the needs of the sport, attendance at events the sport held, gender and ethnic issues, and the amount of funds necessary to run the sport. Based on this criterion, it was determined that the men's swimming, along with men's and women's diving, and men's fencing should be eliminated (Kelley v. University of Illinois, 1994).

The United States court of appeals affirmed the decision in the lower court. The school had the right to pick and choose how it would assure compliance. They were not obligated to cut the same male and female sports. Their only obligation was to ensure Title IX compliance. Since males outnumbered females in both enrollment as well as athletic participation, there was no obligation by the school to keep the program (Kelley v. University of Illinois, 1994).

Also in 1994, questions regarding Title IX and the protection of employment arose. Pam Bowers, a coach for Baylor University, sued the school claiming they violated Title IX laws by firing her (Bowers v. Baylor University, 1994). Ms. Bowers coached the women's basketball team for ten years. She began to complain regarding the conditions the women's team was subjected to as compared to the men's team. She cited inadequate resources and unfair pay for her and her staff. The school terminated her in 1993 and placed a formal complaint to the OCR and the Equal Employment Opportunity Commission. Coach Bowers claimed she was terminated because of the complaints and not because of her record (Bowers v. Baylor University, 1994).

The complaint immediately got her the job back, as well as a two-year written contract. Although she was back on the job, she continued her complaints to the two federal departments. At her review in 1993, her record as a coach came under question, and she was told she had to have a winning season in the following year or her contract would not be continued. Following a losing season, she was once again terminated. Coach Bowers sued the school under Title IX regulations (Bowers v. Baylor University, 1994).

The district court determined the school was responsible for a Title IX violation. In the findings, three cases were sited. First, Cannon v. University of Chicago addressed the intent of Congress to create a statute. Although Title IX does not address employees directly, there is intent by Congress to create a remedy for this issue within Title IX (Cort v. Ash was also referred to on this matter). Franklin v. Gwinnett addressed implied cause of action and monetary compensation. Finally, North Haven Board of Education v. Bell addressed discrimination based on gender with respect to employment as well as the validity of the regulations within Title IX. The court did release the individuals from liability and held only the school responsible for the action (Bowers v. Baylor University, 1994).

In December of 1994, twelve members of the slow-pitch softball team at a high school in Kentucky sued the Kentucky High School Athletic Association (KHSAA) and the Kentucky Board of Education as they wanted to start a fast-pitch softball team and have it sanctioned by both organizations (Horner v. KHSAA and Kentucky State Board of Education 1994). The athletes stated the KHSAA violated not only Title IX, but also the Equal Protection Clause of the 14th Amendment. The girls cited the increasing

importance of fast-pitch softball in intercollegiate sports. They claimed the addition of the team would provide more appropriate competition than the slow-pitch sport could offer, and also stated that fast-pitch softball was a more even comparison to baseball. The defendants offered the rule they had in place stating, "A new sport will not be sanctioned unless at least 25% of the member schools indicate a willingness to participate (Horner v. KHSAA and Kentucky State Board of Education, 1994)."

The district courts determined the defendants had not violated the regulations of Title IX or the Equal Protection Clause. The appellant court, however, reversed the decision. The first question was whether the KHSAA received federal funding. The district level judge could not find an instance where federal funding was received. The appellant court stated the organization received dues from each of the schools in the state. Since the schools receive a large amount of federal funding, the dues are paid with the same monies. This would require the organization to follow Title IX regulations. Secondly, the court needed to determine the legality of the twenty-five percent rule. Title IX does not give a specific number to fulfill the prong requiring the accommodation of interests of the underrepresented sex. When the survey of schools was initially sent out, only 9% responded they would want to field a team. On the second attempt, 17% responded in favor of a team. The question lies with how many schools did not respond. It is uncertain how they would vote if forced. Regardless, it was determined 17% shows there is clearly enough interest in sanctioning the sport (Horner v. KHSAA and Kentucky State Board of Education, 1994).

Finally, the question of whether the Equal Protection Clause had been violated was addressed. The key to this question lies in the wording. The law uses the words

"intentional discrimination." From the evidence provided, there was no instance proving that the KHSAA intentionally discriminated against the girls. Due to these factors, the appeals court reversed the Title IX decision and affirmed the decision regarding the Equal Protection Clause (Horner v. KHSAA and Kentucky State Board of Education, 1994).

The increasing amount of suits being filed since the inception of Title IX caused a reaction by Congress. In 1994, Congress passes the Equity in Athletics Disclosure Act. This "requires all coeducational institutions of higher education that receive federal student aid and that have intercollegiate athletic programs to annually disclose extensive information about those athletic programs (MARGARET fund, 2005)." The law added to the accountability set forward by Title IX. Schools were given until October 1, 1996 to compile the data and provide their first report (MARGARET fund, 2005).

In 1995, The House of Representatives held hearings on Title IX to discuss complaints regarding Title IX and whether it was fulfilling its intent and purpose. Representative Buck McKeon, the chairman of the subcommittee, demanded the Office of Civil Rights "satisfy concerns expressed by the committee, or face another set of hearings after the first of the year ("News archive")." More specifically, the subcommittee requested a clarification on the expectations for compliance the OCR has for colleges. The claim was there were too many areas confusing to the schools. Understanding the need for clarification, Norma Cantu, the assistant secretary for civil rights from the USDOE, presented an updated version of the Title IX manual on September 20, 1995 for a thirty-day review ("News archive").

On October 18, 1995, Ms. Cantu testified before the committee (Cantu, 1995). She covered the many situations where women fell far behind compared to men. She told of how, prior to Title IX, the OCR found unfair conditions such as an imbalance in scholarship money, unfair conditions at schools such as different locker room conditions, different field time, and different pay for coaches of the teams. Following the laws inception, incredible gains had been seen, but a large amount of work was still needed. Cantu told of how important the law was to women. She stated that the law helped increase the number of female participants beginning at the elementary school level. This increase meant more women competitors at all levels, including in Olympic sports. Off the field, research showed an increase in participation by women has led to a decrease in teen pregnancy and drug use by women. Also, she recounted the values they learned such as, "Teamwork, standards, leadership, discipline, work ethics, self sacrifice, pride in accomplishment, and strength of character (Cantu, 1995)." She spoke of the clarification of the three-part test – a key aspect to explain Title IX compliance. She was clear in stating that nowhere in the three-part test does it state schools should eliminate male sports to come in compliance with the law. She concluded by assuring the OCR would continue to investigate all Title IX complaints, and will continue to work with educational organizations to be proactive and help to avoid such complaints from occurring (Cantu, 1995).

The result of the hearings was the publication of a clarified manual for schools on January 16, 1996. The manual proved to have few major changes. This update did not result in a reduction of complaints to the OCR. For example, a continuation of Cohen v. Brown University (1996) occurred. This was a continuation from the temporary

injunction to allow the female sports to return to "university-varsity" status. The district court determined that the school was still not in compliance of Title IX based on the proposed changes made by the school (Cohen v. Brown University (II), 1996).

Once again, Brown contested the interpretation of the "three-prong test" as well as the damages awarded. At the appeal, it was determined when the four teams were reduced from varsity status, they were denied the highest level of competition available. Also, they were denied the same opportunities for practices, field/gym time, etc. The appellant court agreed with the district court regarding compliance. The court did not agree with the decision by the district court to impose specific relief regarding compliance. Although the court could determine a need for a remedy to the noncompliance issue, it did not have the authority to give specific instructions on how to accomplish compliance. The school had the right to correct the issues however they deemed the best solution, provided they pass the three-part test. This meant the case was returned back to the district court, and the corrections were made (Cohen v. Brown University II, 1996).

One of the most interesting attempts at compliance occurred in 1997 in Merritt Island, Florida. Members of a girl's softball team filed a lawsuit because they did not have an equal facility to the boy's baseball team (Daniels v. School Board of Brevard County, 1997). Two sisters who were members of the softball team for Merritt Island High School (MIHS) sued the Board of Education so that the softball team could receive an electronic scoreboard, a batting cage, new bleachers, signs to publicize the girl's softball program, restrooms, a concession stand, press box, announcer's booth, a program

for field maintenance, and lighting in order to host night games – all things the baseball team already possessed (Daniels v. School Board of Brevard County, 1997).

The district court determined the school was in violation of Title IX because the softball team had significantly lesser facilities than the baseball team. The courts granted the plaintiffs with a preliminary injunction, and gave the school until December 15, 1997 to create a plan to rectify the situation. Instead of making the modifications to improve the conditions for the softball team, the school board created a plan to remove all of the amenities the baseball team possessed. In response to the actions, a second lawsuit of the same name (December, 1997) was filed. The school board stated the cost to come into compliance was exorbitant due to the amount of schools needed to come into compliance. Of course, the question was whether the school board could legally remove amenities from a male team to come into compliance with Title IX requirements (Daniels v. School Board of Brevard County (II), 1997).

First, the school board suggested the baseball team not use the electronic scoreboard, part of the bleachers, the concession stand, press box, announcer's booth, and the lights (a plan was in place to light the girl's field, but if it was not accomplished by the start of the softball season, the baseball team would not be permitted to use their lights). The reason these items could not be shared was due to the design of each structure. It was suggested that the batting cage and bathrooms be shared by the teams. The main sign would be changed to accommodate all teams, and the sign in the baseball field would be removed (Daniels v. School Board of Brevard County (II), 1997).

While this case was being tried, two similar cases to include the other schools in Brevard County were filed. The courts responded by confirming the reasonable

suggestions, but addressing the unreasonable ones. The school board was given until January 26, 1998 to remove the fence so both teams could use the restrooms, open the batting cages to both teams, change the signs, and install lights for the girl's facility. The court did not feel it was appropriate to limit what the boys already had in place, so they stated the baseball team could use the concession stand, press box, announcer's booth, scoreboard, and bleachers pending the outcome of the two similar cases (Daniels v. School Board of Brevard County (II), 1997). Since the case was decided, an electronic scoreboard, concession stand, and an upgrade of the bleachers have occurred ("Merritt Island High School Athletics," 2006).

In March of 1997, the OCR helped the public see Title IX protected more than just athletics. The organization published "Sexual Harassment Guidance: Harassment of Students by School Employees, Other Students, or Third Parties (MARGARET Funds, 2005)." The hope was to provide guidelines for schools to protect all students from sexual harassment. Of course, this publication sparked awareness and allowed for complaints regarding the topic to the OCR.

In 1998, Alida Star Gebser, a high school student in Texas, had a sexual relationship with one of her teachers (Gebser v. Lago Vista Independent School District, 1998). She did not report this relationship to anyone at the school. During the same time, two other parents filed complaints regarding sexual comments made by the same teacher. The teacher was talked to by school officials, but no formal complaint was filed with the school board or the superintendent. The teacher was later found having intercourse with the student by a police officer and was arrested. He was subsequently terminated by the district. Following the termination, the student and parent filed a

lawsuit against the teacher and the school district, claiming sexual harassment under Title IX (Gebser v. Lago Vista Independent School District, 1998).

The district court determined the girl and her family were not protected under Title IX. The main reason for this is because no one at the school was aware of the relationship. Although the school did not properly report the incident regarding the comments, the case did not involve the plaintiff and was also not protected by Title IX. When the case was brought to the Supreme Court, it was reiterated that damages could not be recovered and the school board or school could not be liable unless they are sufficiently aware of the details regarding the sexual harassment and they do not do everything possible to rectify the situation (Gebser v. Lago Vista Independent School District, 1998).

In 1998, the focus of Title IX shifted back towards athletics. R. M. Smith, a volleyball player, had played volleyball for St. Bonaventure University in her undergraduate program (NCAA v. Smith, 1999). She desired to continue playing in her post-baccalaureate program through another university, but was not permitted to by the NCAA. The organization, which oversees all collegiate athletic programs, said Ms. Smith was not eligible to play due to a rule which states, "A student-athlete who is enrolled in a graduate or professional school of the institution he or she previously attended as an undergraduate (regardless of whether the individual has received a United States baccalaureate degree or its equivalent), a student-athlete who is enrolled and seeking a second baccalaureate or equivalent degree at the same institution, or a student-athlete who has graduated and is continuing as a full-time student at the same institution while taking course work that would lead to the equivalent of another major or degree as

defined and documented by the institution, may participate in intercollegiate athletics, provided the student has eligibility remaining and such participation occurs within the applicable five-year or ten-semester period set forth in 14.2 (NCAA v. Smith, 1999)."

The main question was whether the NCAA was required to adhere to Title IX, as they do not directly receive federal funding. The district court judge granted the motion for dismissal, stating the NCAA did not directly receive the funding. The appellant court noted the organization received dues from every school it covers. These dues come from federally funded schools, thus determining the organization indirectly received federal funds. The Supreme Court, however, determined this indirect reception of funds was not enough to hold the organization to the regulations of Title IX (NCAA v. Smith, 1999).

In 1998, the OCR addressed scholarships and their relationship to Title IX (MARGARET Funds, 2005). On July 23, 1998, an explanation was given on the requirements to distribute scholarships in order to stay in accordance with Title IX. The clarification was made in a letter to Bowling Green State University. It states that distribution should be in proportion to participation. In other words, if 55% of athletes at the school are male, then 55% of athletic scholarship money should go to men, within 1% or one full scholarship (MARGARET Funds, 2005).

While the OCR focused on athletics, other Title IX cases regarding sexual harassment continued to be filed. In 1999, Aurelia Davis sued the Monroe County board of education regarding sexual harassment (Davis v. Monroe County, 1999). From December of 1992 to May of 1993, Davis was sexually harassed by a fellow fifth-grade student for a six month period. This student allegedly grabbed her breasts, made suggestive comments, and created a hostile learning environment. Davis sued the school

board under the Title IX law, as she made multiple attempts to report the incidences to teachers and school officials. No one at the school addressed the issue with the other student, no attempt to separate the students (class switch for the boy) was made and no official report was made to the school board or superintendent. The boy was arrested in May of 1993 and pled guilty to sexual battery (Davis v. Monroe County, 1999).

The district court ruled to dismiss the Title IX claim, stating the law did not provide for a private cause of action regarding student-on-student sexual harassment. The case went to appeal where the court reversed the decision, but allowed for a rehearing of the case. Following this, the appellant court affirmed the district court's ruling. The Supreme Court reversed the decision. The determination began with the idea the school had an obligation to make attempts to eliminate the problem. By choosing not to address the issue, it created an environment not suitable for learning. It was revealed Ms. Davis spoke to the principal who asked her why she was the only one complaining. Also, when asked to move her seat, she was denied for three months. As a result of these ongoing incidents, her grades dropped from the A-B average she had maintained prior. For these reasons, Ms. Davis was granted compensatory damages (Davis v. Monroe County, 1999).

Between 2000 and 2003, continued adjustments to Title IX occurred. In November of 2000, the OCR proposed changes to the sexual harassment manual (MARGARET Funds, 2005). In 2001, the United States Department of Justice publishes the "Title IX Legal Manual." The purpose was to provide an overview of the law, not to act as a "comprehensive directory of all cases or issues related to Title IX (US Department of Justice, 2001)." This was followed by a creation of the Title IX

commission by the department of education in 2002. The goal was to create resolutions to reaffirm Title IX. A second commission was organized in 2003 to address majority and minority reports. As a result of these commissions, in July of 2003, an update of clarifications regarding compliance was created (MARGARET Funds, 2005).

In 2003, the National Wrestling Association sued the Department of Education in the hopes to show Title IX is hurting males while it is helping females (National Wrestling Coaches Association (NWCA) v. United States Department of Education (USDOE), 2005). The goal was to have the courts determine the policies and regulations of Title IX illegal, due to the fact that they discriminate against men (MARGARET funds, 2005). This would allow schools to reinstate wrestling in the colleges being represented in the suit, so as to provide the opportunities men previously had prior to the law. The group argued that while the opportunities for female athletes to succeed were dramatically increased, the opportunities for male athletes were reduced in many schools just so the school would be in compliance of the law (NWCA v. USDOE, 2005).

The plaintiffs showed the history of participation in men's sports since the inception of Title IX has fallen. They attest this to the fact most schools have cut programs for men as opposed to solely increasing the number of athletic opportunities for women in order to gain compliance. Schools often chose wrestling as the easiest program to eliminate, since the amount of interest in the sport had decreased over the years. The result of these actions was a reduction in competition at all levels including the national Olympic team. For these reasons, the plaintiffs motioned for a temporary injunction until the law could be improved to truly protect all (NWCA v. USDOE, 2005).

The district court judge dismissed the case. Nowhere in Title IX does it state that a school can not eliminate a sport or restrict the number of participants in order to be in compliance with the regulations. Also, the judge noted even if the injunction was awarded, "it can reasonably be supposed that the remedy, if granted, will inure to the benefit of those members of the association actually injured," as many colleges who removed wrestling and other male sports cited budget cuts as the reason (NWCA v. USDOE, 2005).

Does Title IX protect against retaliation? In 2004, Roderick Jackson, a girl's basketball coach, filed suit against the Birmingham Board of Education because he claims he was fired for complaining about the unfair conditions the girl's team had as compared to the boy's team (Jackson v. Birmingham Board of Education, 2005). Mr. Jackson complained to Ensley high school officials when he became aware his program received less funding, less equipment and poorer facilities than the boy's basketball team. Following the complaints, he received poor work evaluations and was subsequently released from his position. He sued the school district claiming they had violated Title IX because he was clearly fired due to his complaints. The district court judge dismissed the case, stating Title IX does not allow for a private cause of action to protect against retaliation from sex discrimination claims. The appeals court went one step further, claiming even if the law does protect against the action, Mr. Jackson himself was not part of the group the law protected. The Supreme Court reversed and remanded the case. Although Mr. Jackson was unfairly excluded from the group protected by Title IX, the burden of proof was on him to prove he was released because of his complaints (Jackson v. Birmingham Board of Education, 2005).

The History of the Single-Sex Classroom

The *No Child Left behind Act* of 2001 allows for the option of single-sex classrooms to be used. The idea of using single-sex classrooms, however, has existed in the U. S. for over 300 years. Boston Latin School, the first public school in the U.S., opened its doors on April 23, 1635 to only boys ("History of Boston Latin School," 2007). The belief was that it was unnecessary to educate women. The school went through changes throughout the years, but did not accept women until 1972 ("History of Boston Latin School," 2007).

Many different schools across the country have taken advantage of the opportunity to see if single-sex classrooms will raise student achievement, especially regarding boys. In the United States, success has been mixed. Thurgood Marshal Elementary school in Seattle, Washington began the single-sex option with a fourth grade classroom, and expanded the idea through the entire school (Schachter, 2003). In the first two years of the program, standardized test scores rose by 17% in reading and 16% in mathematics (Schachter, 2003). In California, five million dollars was allocated toward the creation of single-sex academies in the hopes of mimicking the success found in private schools (Viadero, 2001). In actuality, the program, "reinforced gender stereotypes, squandered opportunities to address issues of gender inequity, and exposed students to teasing from peers in coeducational classes" (Viadero, 2001, p. 9). Even though the overall program failed, one school did survive, showing improvements in grades and a decrease in discipline issues (Viadero, 2001).

The use of single-sex classrooms to improve achievement has been used internationally for many years as well. In a study out of Australia, researchers looked at

the success of using single-sex classrooms to specifically help boys through the educational process (Lingard et al., 2005). Students from school years 6 and 7 (the final years of the primary grades) were used. In one of the single-sex classes, 25 of the boys were determined to have the most problems regarding discipline. The goal of the qualitative studies was to see if the separation of students would result in better performance (Lingard et al., 2005).

Results for the boys showed vast improvements regarding discipline. Initially, the boys acted up toward each other; however, this dissipated over time. The largest improvements came in the class of students with the largest discipline issues. Since these students changed their behavior, fewer models of bad behavior existed, thus affecting the entire population. Teachers of these classes also noticed a larger desire to learn by the boys, as the normal distractions were minimized. The principal did state that the setting was not beneficial to boys who were quiet and reserved, as they were intimidated by the overpowering competition (Lingard et al., 2005).

Results from the girls were not as positive. Teachers of the single-sex girl classes said their students missed the constant interaction with the boys. Although the opportunity for deeper conversations existed, not all of the teachers took advantage of it. The overall impression was the single-sex girls' classes were a "by-product of the move to boys' classes" (Lingard et al., 2005, p. 250). The authors stated better results may have occurred if teachers received professional development regarding teaching to single-sex classes (Lingard et al., 2005).

In a 1999 study from Alberta, Canada, three different public schools were investigated (Blair & Sanford, 1999). The study looked at the effectiveness of single-sex

public education with regards to girls. At East Glen School, the all-girls program was implemented in 1995 in the hopes of attracting, "students to a shrinking school population" (Blair & Sanford, 1999, p. 6). Since its creation, the school has broadened the single-sex offerings to an equal amount of all-boys' and all-girls' classes (Blair & Sanford, 1999).

Nancy Major All-Girls Junior High School is a more diverse and in a more urban neighborhood than the others (Blair & Sanford, 1999). It was opened in 1995 to offer single-sex education to the working class family. The school began with 80 students and since has grown to over 200 in 1997. It has also opened up a second campus for an additional 100 girls in a predominantly middle-class portion of the city; however, both schools are made up of students from all different parts of the region (Blair & Sanford, 1999).

Wood Harbor Junior High School offers both coed and single-sex classes (Blair & Sanford, 1999). The school began the single-sex program in 1997 with five single-sex classes (one boy's class in both grade seven and eight), but has since reduced the number to only two all-girl's classes (Blair & Sanford, 1999). The teachers began the program without any change in curriculum or format. Following the initial year, only the all-girl program remained. The school reinstated the program for boys in the 1999-2000 school year; however, a revamping of the curriculum better aligned to accommodate the needs of boys was created (Blair & Sanford, 1999).

Researchers indicated that the single-sex classrooms were most successful when more than just gender separation occurred. All participants concurred that the change alone had no significant impact. When such things as the make-up of the room, the style

of teaching, and the amount of time spent in both discussion and instruction were altered, increased success was apparent. "We want to reiterate that these programs are changing the nature of their schools. It is exciting to see teachers, students, and administrators acknowledge that gender matters in school" (Blair & Sanford, 1999, p. 12).

It appears that more research is needed to truly know if single-sex classrooms can be an effective tool in improving achievement. This study will use data from standardized test scores to see if those in a single-sex environment are more successful than those in a traditional, co-ed environment.

Summary

It is evident there is great room for growth regarding the law and the protection of equal rights within the education system. Now, almost 35 years later, it appears Title IX might not be doing what it was originally created to do. It is important for the OCR to adjust the regulations and require schools to provide more opportunities for both genders as opposed to reducing them for compliance. These adjustments should be made to cover discrimination on the field and in the classroom. Until this growth occurs, true equity in schools can not be achieved.

CHAPTER THREE: METHODOLOGY

Schools across the country are trying to help improve student success in reading through the use of single-sex classrooms. This study investigated the significance of single-sex education as compared to coeducational education. Specifically, it looked at whether students who were in single-sex reading classes outperformed students in coeducational reading classes. Following this, the study looked at whether boys in single-sex classes outperformed boys in coeducational classes. Third, the study investigated if a significant difference in learning gains existed between the boys in single-sex classes and those in coeducational classes. Finally, the study investigated similarities and differences within single-sex and coeducational classes.

To date, the following procedures have taken place. First, an extensive review of literature was performed. This led to the acquisition of data from three schools that had both single-sex and coeducational classes for the 2006-2007 school year. The data were then examined using SPSS 13.0. Concurrently, a questionnaire regarding teaching strategies as well as reading programs being used was distributed to teachers from the three selected schools. The responses were evaluated for similarities and differences as well as the elaborations provided by teachers. Finally one school was visited so that teachers could have the opportunity to elaborate on their responses from the questionnaire.

Research Questions

This study focused on the following research questions:

1. To what extent is there a difference in reading proficiency regarding state standardized test scores in single-sex classes and scores in coeducational classes?
2. To what extent is there a difference in reading proficiency regarding state standardized test scores between boys in single-sex classes and boys in coeducational classes?
3. To what extent is there a difference in learning gains regarding reading between boys in single-sex classes and boys in coeducational classes?
4. Other than the gender structure, to what do teachers of single-sex and coeducational classes attribute the success of their students?

Hypotheses

These questions led to the following hypotheses:

1. There is a significant difference in reading proficiency regarding standardized state test scores in single-sex classes and scores in coeducational classes.
2. There is a significant difference in reading proficiency regarding state standardized test scores between boys in single-sex classes and boys in coeducational classes.
3. There is a significant difference regarding reading learning gains between boys in single-sex classes and boys in coeducational classes.

4. Teachers in successful classrooms, based on reading proficiency regarding state standardized test scores, are using best practices and unique techniques to teach students in their classes.

Development of the Instrument

To begin the research, information regarding single-sex classrooms was gathered from the National Association of Single-Sex Classroom's (NASSPE) website. The list contained 262 schools that reported to have single-sex classrooms, but not entire single-sex schools. The list was updated as of August 2007 (NASSPE, 2007). Next, an investigation was performed to see if each of the schools could be contacted via e-mail. The principal of each school was e-mailed with a five-question construct (Appendix A) to clarify questions regarding the single-sex program (When the single-sex program began, what classes were single-sex, what grades, were coed classes offered in the same grade). If the e-mail address for the principal was not available, the e-mail was sent to an assistant principal. The school was chosen for the study if the recipient returned the e-mail and the responses qualified them to participate.

The initial e-mail resulted in three schools willing to participate. Two of the schools were located in Florida and one in Louisiana. Next, the principal from the school was sent a follow-up e-mail requesting the required data (Appendix B). Schools were asked to provide 2006-2007 state test scores regarding reading for the grades that contained both single-sex and coeducational reading classes. The request included data disaggregated by class as well as by student and included information regarding grade, whether they participated in a single-sex or coeducational classroom, and the reading test scores for 2006-2007. In two of the three schools, information regarding whether the

student made learning gains based on the requirements determined by each individual state was also provided. Two of the three schools provided this information directly; one school referred the researcher to the district office who, in turn, provided the information. Once the data were collected, statistical tests were performed in SPSS version 13.0.

Following data collection, the principals from each school were contacted and asked for permission to contact the teachers from the data sets. Once approval was given, an e-mail was sent to the teachers requesting their participation through a questionnaire (Appendix C). This questionnaire was designed to determine teaching style, the textbooks and programs being used and the feelings toward the programs being used (Appendix D). The reasoning goal was to determine if certain teaching styles were favored by successful teachers.

Responses were minimal. For this reason, one of the schools (Louisiana) was visited following permission from the principal. Teachers were asked questions provided on the questionnaire and given the opportunity to expand on their answers. Following both forms of response collection, all data were analyzed using SPSS version 13.0 as well as through simple data analysis methods.

Procedure

Three separate case studies were performed. This was necessary due to the difference in states, schools, and grades used. Cases two and three were evaluated using each research question and subsequent hypotheses; case one was evaluated using the first two questions and hypotheses as this was the only data provided.

For hypothesis four, data were compiled from cases two and three. The principal from case one requested the questionnaire not be sent to their teachers as they are

inundated by questionnaires regarding the topic. Due to the minimal responses to the initial questionnaire send out, the school from case three was visited with permission from the principal. Teachers were asked the questions found on the questionnaire and were given the opportunity to elaborate on those answers.

Hypothesis 1: There is a significant difference in reading proficiency regarding standardized state test scores in single-sex classes and scores in coeducational classes. The data from both the single-sex schools and coeducational classes were used. Significance was determined through the use of an independent t-test.

Hypotheses 2: There is a significant difference in reading proficiency regarding state standardized test scores between boys in single-sex classes and boys in coeducational classes. To determine if a significant difference exists, only the male percent proficient scores from the single-sex and coeducational classes were used. Significance was determined through the use of an independent t-test.

Hypothesis 3: There is a significant difference regarding reading learning gains between boys in single-sex classes and boys in coeducational classes. To determine if a significant difference exists, data from only the male students in both single-sex and coeducation classes were used. Significance was determined through the use of an independent t-test.

Hypothesis 4: Teachers in successful classrooms, based on reading proficiency regarding state standardized test scores, are using best practices and unique techniques to teach students in their classes. For this hypothesis, each teacher from the school in the case was e-mailed a 13-question construct. After an allowance of two weeks for responses, it was determined that other methods to receive responses were needed. The

principal from the school in case three agreed to have the researcher visit the school and ask the teachers the questions from the survey. Questions were limited to those found on the questionnaire; however, teachers were permitted to elaborate on those answers. Following the visit, each subject's responses were evaluated individually to preserve the quality of their answers. Finally, all responses were evaluated together to see if similarities in responses existed.

Statistical Method

All data were analyzed using SPSS for Windows version 13.0. For research questions one through three, an independent t-test was performed on all three cases and a chi-square test of independence was performed on case two and three. For question four, responses to the questionnaire were individually discussed. Following this, the frequencies of responses were evaluated.

Summary

This study looked at whether single-sex classrooms are an effective option in helping boys to improve their reading ability. The study incorporated data from three separate schools following detailed investigations as to the qualifications of each school in regards to single-sex classrooms. The case studies resulted from both written questionnaires and personal teacher interactions.

CHAPTER FOUR: ANALYSIS OF DATA

Introduction

The purpose of this study was to investigate the success of single-sex education as compared to coeducational education. Specifically, it was to determine whether students who were in single-sex reading classes outperformed students in coeducational reading classes. Finally, the researcher observed the strategies teachers are using within classes deemed to be successful regarding reading.

The data sources for the present study came from two distinct locations. First, individual, anonymous test scores from the 2006-2007 reading exam for the particular state were provided by the school either directly or through the district office. This also included whether a student made learning gains based on the requirements established for No Child Left Behind. Secondly, results from a questionnaire (Appendix D) distributed to each teacher of the chosen grade were disaggregated to determine the role the teacher played in the effectiveness of student performance. Trends in responses were reported.

The review of the data began with a separation of each school into separate cases. This was performed since each school was different in size as well as location. Two schools were located in the same state; however, since the size of the school as well as the district was different, they were viewed separately. The schools themselves were chosen based on an array of different characteristics. First, they were indicated by the NASSPE as containing both single-sex and coeducational classes. The list was reduced to contain only schools with websites. Next, the school agreed to participate. Each principal from the school on the list generated by the NASSPE that had a website was

contacted via e-mail (Appendix A). This contact contained questions regarding their single-sex program. These questions qualified the school as well as acted as an agreement to participate. A follow-up e-mail (Appendix B) was sent soliciting the required data. From the initial list containing 262 schools, four were chosen. The data were disaggregated and statistical tests were performed in SPSS version 13.0.

Following this, a third e-mail (Appendix C) was sent to obtain a list of the teachers from the grades that were used as well as e-mail addresses or a reference to obtain said addresses. Along with this request, a copy of the questionnaire was included for the principal to approve for distribution. Once the list was received, the questionnaire was e-mailed to the teachers. Each teacher was given two weeks to fill out the questionnaire and return it via e-mail. Explicit instructions were provided in both the e-mail as well as on the questionnaire. Upon return of the questionnaire, the data were analyzed using a qualitative approach.

Responses to the questionnaire were minimal. Of the initial sample (n = 11), only two responses were received. For this reason, a determination to acquire the data by other methods was explored. The principal from case three invited the researcher to visit the school and speak to the teachers from the single-sex team directly. It was agreed the teachers would only be asked the questions found on the questionnaire; however, teachers were permitted to elaborate on these questions. This tactic more than doubled the number of responses (n = 5).

For evaluation purposes, each school was looked at as a separate case for research questions one through three. In case one, only research questions one and two were addressed as the data for question three were not available. For research question four,

the returned questionnaire responses were evaluated on an individual basis due to the number of responses. Following the individual evaluation, the responses were looked at together to see if frequencies occurred.

Survey Instrument

The questionnaire used to gather the data for research question four (Appendix D) contained 13 questions and the opportunity for free response. The questions looked at the seven teaching strategies as outlined in Georgia Kosmoski's book Supervision (1999), the preferred strategy, professional development regarding brain-based instruction, and the reading programs being used. Throughout the questionnaire, the respondent was given the opportunity to expand on their answers.

Characteristics of Respondents

Respondents were teachers who taught either a single-sex or coeducational class during the 2006-2007 school year. More specifically, they came from the schools chosen for each case. Within each case, the teachers all taught the same grade as well. The schools for each case were chosen from a list generated by the NASSPE. Participation in completion of the questionnaire was granted by the principal. Of the 11 teachers who met the qualifications, one subject (9%) submitted the questionnaire by e-mail, one subject (9%) responded initially by e-mail and then added additional information verbally when visited, and four subjects (36%) responded verbally when visited. Each subject's responses were looked at individually and responses were reported anonymously. Following the initial evaluation, frequencies in responses were evaluated.

Definition of Variables

This section contains a brief definition for the independent and dependent variable for each research question. The variables did not change based on case.

Research Questions One and Two

1.) To what extent is there a difference in reading proficiency regarding state standardized test scores in single-sex classes and scores in coeducational classes?

2.) To what extent is there a difference in reading proficiency regarding state standardized test scores between boys in single-sex classes and boys in coeducational classes?

The independent variable for this question was the class they were in (Single-sex or Coeducational). The thought was that the class they were in will determine the SCORE (dependent variable). The difference between the two questions is that in the first one, all genders were included. For the second question, all females were removed.

Research Question Three

To what extent is there a difference in learning gains regarding reading between boys in single-sex classes and boys in coeducational classes?

For this question, the independent variable was once again the class they were in. The dependent variable, however, was the amount of learning gains they achieved. The thought was that the amount of learning gains made was based on the class you were in.

Data Analysis

Case One

Case one involved an elementary school located in central Florida. The school earned an 'A' grade as defined by the Florida Department of Education's School Accountability. This has been achieved by the school for the last six years. Enrollment in elementary schools (K-5) from the district was approximately 30,000 for 2006-2007 (FLDOE "Volusia county school district", 2007). The school has over 800 students and 60% of the students are on free and reduced lunch (Hicks, 2007). For this case, third grade students were used (n = 117). The sample was separated by single-sex and coeducational reading classes. The single-sex group (n = 20) contained only males. The coeducational group (n = 97) contained 80 males (82.4%) and 37 females (17.6%). All data were obtained at the district level.

The language arts scores on the third grade Language Arts portion of the FCAT were observed. The FCAT is Florida's state assessment tool that evaluates performance on math and reading at the third grade level. The questions asked were based on the sunshine state standards, a list of expectations for each grade level that is tested. Once the tests were graded, their raw score are translated into a developmental scaled score (DSS) so parents were able to see from year to year if students were making progress. This score ranged from 0 to 3000. For the purposes of this study, the DSS was used.

Research Question One

To what extent is there a difference in reading proficiency regarding state standardized test scores in single-sex classes and scores in coeducational classes?

The question was observed to see if a statistically significant difference could be seen in reading standardized test scores from students who were in single-sex and coeducational classes. The sample was divided into single-sex (n = 20) and coeducational (n = 97). An independent t-test was completed to determine if a statistically significant difference could be found. Levene's test indicated no violation of the assumption of homogeneity (F = 0.222; p > .05), so equal variances could be assumed. The independent t-test indicated there was no statistically significant difference at α = 0.05, but there was a statistically significant difference at α = 0.10 (t(115) = -1.822; 0.05 < p < 0.10). Students in single-sex classes (M = 1459.75; SD = 332.437) scored higher than those in coeducational classes (M = 1316.74; SD = 317.003). That is to say that those in single-sex classes, on average, were more successful than those in coeducational classes.

Research Question Two

To what extent is there a difference in reading proficiency regarding state standardized test scores between boys in single-sex classes and boys in coeducational classes?

For this question, only the male students were used. The two groups were the male students from the single-sex class (n = 20) and those from the coeducational classes (n = 60). The goal was to determine if a statistically significant difference occurred between groups. Levene's test indicated no violation of the assumption of homogeneity (F = 0.410; p > .05), so equal variances could be assumed. The independent t-test indicated a statistically significant difference existed at α = 0.05 (t(78) = -2.134; p < 0.05). Thus, male students in single-sex classes (M = 1459.75; SD = 332.437) scored significantly higher than male students in the coeducational classes (M = 1285.18; SD = 311.623). In

other words, the boys in single-sex classes, on average, were significantly more successful than those in coeducational classes.

Research Question Three

To what extent is there a difference in learning gains regarding reading between boys in single-sex classes and boys in coeducational classes?

Information regarding learning gains was requested from the district. (The district declined to provide the information, so this question could not be analyzed.)

Case Two

Case two involved an elementary school located in south Florida. For 2006-2007, the school earned an 'A' grade as determined by the Florida department of Education (FLDOE "2006-2007 school grades", 2007). Enrollment in elementary schools from the district was approximately 33,300 for 2006-2007; the school itself contained 684 students in grades K-5 (Lee County Public Schools, 2006). For this case, fifth grade students were used (n = 112). Once again, the sample was separated by single-sex male (n = 12) and coeducational (n = 100) reading classes. The coeducational class contained 52 males (52%) and 48 females (48%). The fifth grade Language Arts DSS scores on the FCAT were used for evaluation purposes.

Research Question One

To what extent is there a difference in reading proficiency regarding state standardized test scores in single-sex classes and scores in coeducational classes?

Again, the researcher was looking for a statistically significant difference in reading standardized test scores from students who were in single-sex and coeducational

classes. The sample was divided into single-sex (n = 12) and coeducational (n = 100). Levene's test indicated no violation of the assumption of homogeneity (F = 3.016; p > .05), so the assumption of equal variances could be made. The test showed no statistically significant difference at the α = 0.05 or α = 0.10 level (t(110) = -0.786; p > 0.05). The students in coeducational classes (M = 1788.28; SD = 384.697) on average, scored higher than those in single-sex classes (M = 1699.75; SD = 163.260). In other words, students in coeducational classes, on average, were more successful than those in single-sex classes.

Research Question Two

To what extent is there a difference in reading proficiency regarding state standardized test scores between boys in single-sex classes and boys in coeducational classes?

For this question, only the male students from both class types were used. The students in single-sex classes (n = 12) were compared to those in coeducational classes (n = 52) to see if a statistically significant difference in the means existed. Levene's test indicated no violation of the assumption of homogeneity (F = 2.868; p > .05), so the assumption of equal variances could be made. The independent t-test indicated no statistically significant difference at both the α = 0.05 and 0.10 levels (t(62) = -1.455; p > 0.05). While not significant, male students in coeducational classes (M = 1865.52; SD = 384.727) on average, had a higher mean than those in single-sex classes (M = 1699.75; SD = 163.26). In other words, the boys in coeducational classes, on average, were more successful than those in single-sex classes.

Research Question Three

To what extent is there a difference in learning gains regarding reading between boys in single-sex classes and boys in coeducational classes?

To begin, the researcher looked at the frequency distribution (*Figure 1*). In both groups, more boys made learning gains than those who did not. For the coeducational group, 80.4% made learning gains; in the single-sex group, 91.6% achieved the learning gains.

Table 1

Did Students Make Learning Gains (Case Two)

Class Type	Yes	No
Coeducational	37	9
Single-Sex	11	1

Following the frequency distribution, the researcher performed two different tests to see if any significance existed. First, an independent t-test was performed looking for statistically significant differences in learning gains when looking at what classes they were in (single or coeducational). Levene's test showed no significance ($F = 0.915$; $p > 0.05$) indicating an assumption of equal variances. The independent t-test showed no statistically significant difference ($t(56) = 0.601$; $p > 0.05$); however, male students in single-sex classes ($M = 248.08$; $SD = 201.402$) had a higher mean average with regards to learning gains than those in coeducational classes ($M = 198.76$; $SD = 264.199$). This

meant that male students, on average, scored higher learning gains in single-sex classes than in coeducational ones.

Along with the independent t-test, a chi-square test of independence was performed to see if a statistically significant relationship occurred between whether any learning gain was made (yes/no) and the class type the student was in. The thought was that even though significance did not exist when looking at the amount of learning gains, significance may have existed when looking at if any gain was achieved. Once again, only males were used as defined by the question. The test of independence showed no statistically significant relationship (χ^2 (1, N = 58) = 0.359; p > 0.05). In other words, no significant relationship could be determined between single-sex and coeducational classes regarding learning gains.

Case Three

The third school used for this study was located in a rural part of southern Louisiana. Student enrollment in October of 2006 was 624, of which 58% (363) were eligible for free or reduced lunch (LDE, 2007). For the 2006-2007 school year, the school was considered a "school of decline" by the Louisiana Department of Education due to a decrease in school performance scores from the prior year (LDE, 2007). For this case, sixth grade students were used (n = 130). As in the previous cases, the sample was observed as two sub-groups (single-sex and coeducational). The school contained both a single-sex male group (n = 17) and a single-sex female group (n = 15). The coeducational group (n = 98) contained 53% boys (n = 52) and 47% girls (n = 46).

Scores on the sixth grade *i*LEAP exam were used. This is an exam created for the state of Louisiana to assess students in grades three, five, six, seven, and nine. The test is a combination of topics representing a norm-reference portion (taken from the Iowa tests), and a criterion-referenced portion based on state standards (2005-2006 test scores, n.d.). The students are tested in English/language arts, mathematics, social studies, and science. They receive a numeric grade as well as a rating (advanced, mastery, basic, approaching basic, and unsatisfactory) (2005-2006 test scores, n.d.). For this study, only the English/language arts numeric scores were used.

Research Question One

To what extent is there a difference in reading proficiency regarding state standardized test scores in single-sex classes and scores in coeducational classes?

For this question, all single-sex and coeducational student scores were used. The researcher was looking for a statistically significant difference in scores between single-sex and coeducational classes. The sample was divided into single-sex ($n = 32$) and coeducational ($n = 98$). Levene's test indicated a violation of the assumption of homogeneity ($F = 4.664$; $p < .05$), so an assumption of equal variances could not be made. The independent t-test indicated no statistically significant difference in scores at both the $\alpha = 0.05$ and $\alpha = 0.10$ level ($t(94.684) = 1.641$; $p > 0.05$). Although students in single-sex classes ($M = 294.75$; $S.D. = 34.978$) on average outperformed students in coeducational classes ($M = 280.35$; $S.D. = 61.665$), the performance was not significantly greater.

Research Question Two

To what extent is there a difference in reading proficiency regarding state standardized test scores between boys in single-sex classes and boys in coeducational classes?

For this question, only the male students from both class types were used. The researcher looked for a statistically significant difference in scores between male students in single-sex classes (n = 17) and those in coeducational classes (n = 52). Levene's test indicated no violation of the assumption of homogeneity (F = 2.291; p > .05), so the assumption of equal variances could be made. The independent t-test indicated no statistically significant difference at both the α = 0.05 and 0.10 levels ($t(67)$ = 1.472; p > 0.05). Boys in single-sex classes (M = 301.94; $S.D.$ = 33.783) on average, scored higher than boys in coeducational classes (M = 277.71; $S.D.$ = 64.828). In other words, boys in single-sex classes, on average, were more successful than boys in coeducational classes.

Research Question Three

To what extent is there a difference in learning gains regarding reading between boys in single-sex classes and boys in coeducational classes?

To begin, the researcher looked at the frequency distribution (*table 2*). In both groups, more boys made learning gains than those who did not. For the coeducational group, 67.9% made learning gains; in the single-sex group, 52.9% achieved the learning gains.

Table 2

Did Students Make Learning Gains (Case Three)

Class Type	Yes	No
Coeducational	19	9
Single-Sex	9	8

Next the researcher performed two different tests to see if any significance existed. First, an independent t-test was performed looking for statistically significant differences in learning gains when looking at what classes they were in (single or coeducational). Levene's test showed no significance ($F = 2.588$; $p > 0.05$) indicating an assumption of equal variances. The independent t-test showed no statistically significant difference ($t(43) = -1.165$; $p > 0.05$). Boys in coeducational classes ($M = 5.54$; $SD = 22.467$) had a higher mean average with regards to learning gains than the boys in single-sex classes ($M = -3.18$; $SD = 27.144$). Thus, boys in coeducational classes, on average, had higher learning gains than boys in single-sex classes.

Following the independent t-test, a chi-square test of independence was performed to see if a statistically significant relationship occurred between whether any learning gain was made (yes/no) and the class type the student was in. The researcher thought that even though significance did not exist when looking at the amount of learning gains, significance may have existed when looking at if any gain was achieved. Once again, only males were used as defined by the question. The test of independence showed no statistically significant relationship ($\chi^2 (1, N = 45) = 0.317$; $p > 0.05$). In

other words, no significant relationship could be determined between single-sex and coeducational classes regarding learning gains.

Questionnaire Responses

Questionnaires were sent via e-mail to those teachers used in the two cases where the principal gave permission (n = 11). After the two week period, only two responses were received. For this reason, the principal from both schools was contacted to receive permission to visit the school and talk to the teachers in person. Permission was granted by the principal of the school in case three. This increased the number of completed contacts regarding the questionnaire to five (45%). In order to maintain the same anonymity afforded in the e-mail method, subject's responses were recorded without names. The answers from each of the five subjects were evaluated individually. Following this, an investigation of commonalities was performed. The goal was to see not only if any method was used more often, but also to see if specific reading programs were used.

Although the questionnaire was sent to both single-sex and coeducational teachers, only single-sex teachers elected to respond. All respondents included information regarding different aspects of single-sex classrooms as part of the open response sections. The subjects who responded verbally went into depth regarding why they thought single-sex classrooms were effective or not. These conversations stemmed from the question regarding the most effective delivery method for boys (question eight) and the question involving attendance at professional development regarding brain-based research.

Respondent One

The first participant taught reading within a single-sex class for the 2006-2007 school year. She cited using the Accelerated Reading program (AR), the Center for Academic & Reading Skills program (CARS), and the Sensory Training Approach to Reading and Spelling (STARS) program as well as the Harcourt series to teach reading. The respondent indicated attending five or more professional development events regarding brain-based instruction.

When asked about the seven classroom strategies, the respondent indicated using all but Computer Based Learning (CBL) on a daily basis; the use of CBL occurred one to four times a week. She stated learning centers were used to focus on skills within a particular rotation. Also, she stated learning centers give her the opportunity to work with a group of three students at a time. The guided discovery approach is a large part of the learning process as much of the learning within the classroom occurs through hands-on methods. The respondent indicated a constant striving for mastery every day through teacher and student instruction.

The advantage of having a small class can be seen when looking at programmed instruction. The teacher had the ability to pull students and give feedback on a more personal basis with few students in a class. Also, she had the ability to remediate students when necessary. The small class advantage can be noted with the individualized instruction strategy. The teacher stated this strategy occurred during the school day as well as before and after school.

When asked about which method was the most effective with boys, the respondent indicated that no one method was better. She stated that each method is

strong in different ways. The teacher stressed the importance of continuously assessing your students so as to know which method will be the most effective with each student. This was crucial especially when using learning centers and guided discovery. Finally, she stated the key to student success was "watching them process in the different areas and using whatever it takes to move them on."

Respondent Two

The second questionnaire was received via e-mail from a teacher who taught both single-sex boy and single-sex girl classes in 2006-2007. She provided additional information when the school in case three was visited. Initially, the subject indicated using four of the seven strategies listed. At the visit, she indicated using all seven methods. The subject used CBL monthly, "As one of several stations focused on a specific topic in science." She used an "Expository" (direct instruction) approach one to four times a week, "Mainly to lay foundation of concepts." The "Guided Discovery" method was used six to nine times in a two week period to "spike curiosity," as well as a method of topic introduction and a review of topics already taught. Finally, the "Mastery" strategy was used in on a daily basis through "high-order thinking activities and questions."

The teacher stated many different factors played a role in which presentation method was used. She has more than ten years of teaching experience and has taught both single-sex and coeducational classes as the school only used the single-sex method for the 2005-2006 and 2006-2007 school years. She indicated the boys favored a more "hands-on" approach which usually worked best within learning centers and through guided discovery. Also, a mastery approach worked very well as the boys competed to

"one-up" each other. The teacher felt they could push the boys harder to think at a higher level. Unfortunately, the competition factor lead to a loss of social skills while in class and a sense of a more "macho" overtone.

When asked about professional development, the teacher indicated they did not receive any specific training regarding brain-based research. She indicated that part of the problem with the single-sex classes at the school was that the team was never trained to teach any differently then they had in the coeducational class. The subject said that the teachers were asked their opinion regarding a single-sex approach and the team agreed it would be a good idea. The team presented the idea to the school board, and it was approved. The students were chosen randomly to be in the classes, and parents were given the opportunity to opt out. School began the next year exactly as the year prior except that all of the students in the class were the same gender. She felt that the lack of training may have been the reason why the program didn't last.

Respondent Three

Subject three provided responses to the questionnaire verbally during the school visit. He taught single-sex social studies classes for the 2006-2007 school year. The subject indicated using each of the seven presentation approaches throughout a usual week. While teaching the boys, he favored using learning centers as it gives the students the opportunity to move around in the classroom. He also indicated the importance of using manipulatives to maintain the student's interest. The teacher brought up the competitiveness found in the all-boy's classes and said that it was more detrimental than positive. He stressed concerns regarding students who may be intimated by this. With

the all-girl's classes, the teacher found computer based learning to be the most effective method as well as the most enjoyed by the students.

Respondent Four

The fourth teacher provided her answers when the school was visited as well. For the 2006-2007 school year, she taught math in a single-sex setting. She is a veteran teacher who has taught at the school for over twenty years. When asked about her presentation styles, she indicated using an array of different methods throughout a normal week. Most of the time, direct instruction was used for the introduction of a topic where the other methods were used based on the topic being discussed. The subject believed the use of learning centers was the preferred method with the boy's classes as it gave them a chance to move around the room and take a hands-on approach to learning.

The teacher stated that she received no specific training regarding brain-based instruction. She felt that this may have been a reason for the downfall and eventual elimination of the program. She also felt that training regarding how to teach single-sex classes would have been a great help, but she did state that by the start of the second year, a natural adjustment occurred in how she taught the two classes as compared to a coeducational class. The subject preferred the single-sex boy classes to both other types and stated the competition that occurred was "healthy." Finally, she stated the main difference between the two classes was the amount of distractions. She felt when the boys and girls were separated, they were not as easily distracted. This allowed for more of a mastery approach to exist.

Respondent Five

The final subject answered the questions face-to-face at the school visit. She was a first year teacher for the 2006-2007 school year and taught single-sex, language arts. The teacher used the comprehensive curriculum reading program, and stated a strong dislike for the program. She felt it did not allow for enough reading thanks to the heavy focus on writing. When asked about the seven presentation methods, she stated she used all of them throughout a normal week. With the boys, she felt mastery and guided discovery worked the best; with the girls, a heavy stress on guided discovery existed. The teacher felt the girls in the single-sex classes were very "needy." At the same time, she referred to them as "Sheep without a shepherd," meaning that it was rare for one of the girls to step up and lead discussions without encouragement from the teacher. She felt they were afraid to make mistakes as they were afraid of the risk involved, and were dependent on detailed directions. The teacher found herself spending a lot of time walking the girls through the expectations of an assignment. The boys, on the other hand, didn't want direction and performed better when they were allowed to figure the expectations out on their own. She indicated it was easier to challenge the boys and found discussions would lead to an increased amount of mastery level questions.

The teacher stated she received no professional development regarding brain-based instruction and no specific training for the single-sex classes. She said that she saw a need for the training, so she did research on her own and informally shared it with the rest of the team. She said that she did change her presentation methods throughout the year, but it was based on the dynamics of the class more than the research she did. She sited a larger amount of issues with the all-girl classes, but she felt this was probably due

to the time the class occurred (end of day) and the "neediness" of the girls. After teaching this year in a coeducational class, she preferred the all-boys classes even though she had more difficulties regarding discipline with them.

Summary of Teacher Responses

Although the initial intention for the questionnaire was to identify trends in both single-sex and coeducational reading classrooms, the results showed commonalities within single-sex classrooms. Overall, teachers emphasized the need for movement in all-boy classes. The use of learning centers played a crucial role in daily classroom life and the use of manipulatives helped keep these students on task and engaged. Finally, an allowance for competition allowed the boys to reach higher-level questions and achieve a mastery level of topics in a shorter time period. The all-girl classes differed greatly. Teachers found themselves having to use a great deal of guided discussion as the girls were generally hesitant to take a leadership role and were very concerned with making mistakes. The girls favored a computer-based learning approach, which may be a result of their reserved demeanor.

The one commonality regarding the teachers themselves was the lack of training they received. Only one of the five respondents received brain-based professional development, and none of the respondents indicated attending any professional development involving differences in teaching single-sex and coeducational classes. Some of the teachers stated they did adapt to the environment; however, any information they acquired regarding gender differences and brain-based learning came from research done by themselves or people within their department.

Summary

The main goal of this study was to see if single-sex classrooms could provide the substantial help needed to improve the achievement gap between boys and girls regarding reading. The data suggests that further research is needed to confidently state this as truth.

CHAPTER FIVE: SUMMARY, CONCLUSIONS, AND RECCOMENDATIONS

The purpose of this study was to investigate the success of single-sex education as compared to coeducational education. Specifically, it studied whether students who were in single-sex reading classes outperformed students in coeducational reading classes. Further, it looked at significant differences in scores by boys in single-sex classrooms and boys in coeducational classrooms. Finally, it detailed the strategies teachers are using within single-sex classrooms regarding reading. The results of this study provided useful information to the educational community regarding the effectiveness of single-sex classrooms as well as suggestions for improving their efficacy.

The data sources for the present study came from two distinct locations. First, individual, anonymous test scores from the 2006-2007 state reading exam for the particular state were provided by the school either directly or through the district office. This also included whether a student made learning gains based on the requirements established for *No Child Left behind Act* requirements (P.L. 107-110). Secondly, results from a questionnaire (Appendix D) distributed to each teacher of the chosen grade were disaggregated to determine the role the teacher plays in the effectiveness of student performance. Trends in responses were reported.

Summary and Discussion of Findings

Research Question One

To what extent is there a difference in reading proficiency regarding state standardized test scores in single-sex classes and scores in coeducational classes?

Part one of the analysis of data looked at research questions one through three. In question one, the researcher looked to see if a statistically significant difference existed between students in single-sex classes and those in coeducational classes. In all three cases, no statistical significant mean difference existed at $\alpha = 0.05$. In case one, a statistically significant mean difference did exist at $\alpha = 0.10$. On the surface, it appeared that regardless of the standardized test, it was not better for students to be in single-sex or coeducational classes with regards to reading. It is important to consider, however, the size of the samples being compared (Table three).

Table 3

Sample Size by Case (Research Question One)

Case Number	Coeducational	Single Gender
One	97	20
Two	100	12
Three	98	32

In all three cases, the single-sex classroom was much smaller than the coeducational ones. This was due to the fact that the schools had one or two single-sex classes compared to multiple coeducational classes. One would hope that smaller class size would have a positive influence on test scores; however, this was not true in all three cases. In fact, significance occurred when comparing boys in case one and in case two, the coeducational group with larger class sizes outperformed the single-sex group.

When looking at high-stakes test scores, an argument could be made regarding the importance of significance. Although the mean differences were not *significant*, in both

case one and three, students in single-sex classes outperformed students in coeducational classes. In case one, the difference was over 100 points, with students in the single-sex classes having a mean DSS over 100 points higher than the state average of 1356 (FLDOE "2006-2007 3rd grade", 2007). This could be the deciding factor in whether a student is promoted as case one looked at third grade scores. Thus, the ramifications of the results should be considered.

Research Question Two

To what extent is there a difference in reading proficiency regarding state standardized test scores between boys in single-sex classes and boys in coeducational classes?

Question two investigated whether a statistically significant mean difference in test scores existed between male students in single-sex and those in coeducational classes. When the female students were removed, the difference in sample sizes was drastically reduced (Table four).

Table 4

Sample Size by Case (Research Question Two)

Case Number	Coeducational	Single Gender
One	60	20
Two	52	12
Three	52	17

In case one, a statistically significant mean difference occurred. The male, single-sex class students had an average score 150 points higher than the male students in the coeducational classes. With the female students removed, the coeducational mean average only fell approximately 30 points. The data suggested a higher success rate in a critical testing year when boys are removed from the coeducational setting.

As the students got older, the data were not as conclusive. In case two, fifth grade boys in coeducational classes, on average, outperformed those in single-sex classes by over 150 points, indicating as students get older, with regards to the FCAT, a single-sex class may not be as effective as in the younger grades. In case three, scores from sixth grade students taking the *i*LEAP were observed. Boys in single-sex classes outperformed those in coeducational classes; however, the mean difference was only about 24 points.

Research Question Three

To what extent is there a difference in learning gains regarding reading between boys in single-sex classes and boys in coeducational classes?

This question investigated whether a significant mean difference in scores existed regarding learning gains between boys in single-sex classes and those in coeducational classes. Only case two and three were used as the school district in case one did not provide the learning gains for each student. To see if a difference occurred, the amount of learning gains made by each student was compared. In both cases, a statistically significant difference did not exist. In case two, the single-sex group outperformed the coeducational group; in case three, the opposite was true.

Since the results of the independent t-test showed no significance and neither group was consistently better, a chi-square test of independence was performed to see if a significant mean relationship existed. Students were evaluated by whether or not any learning gains were made. In both cases, no statistically significant relationship existed. Although this was the case, a further investigation provided more promising results. In case two, all but one boy in the single gender class (91.6%) and all but nine boys in the coeducational classes (80.4%) made learning gains. This translated into incredible success in a high-stakes test, especially in the single-sex group. Although the numbers were not as impressive for students in group three, more than half of both groups showed positive gains.

Research Question Four

Other than the gender structure, to what do teachers of single-sex and coeducational classes attribute the success of their students?

The last question looked at teacher-preferred presentation styles as well as the tools they use to teach reading. Teachers from case two and three were sent a questionnaire via e-mail regarding these topics (The principal from case one would not allow the questionnaire be sent citing an over saturating of surveys to teachers from the school). Of the eleven teachers sent the questionnaire, only two responded. In an effort to increase the number of responses, the school in case three was visited and teachers from the grade used were asked the questions directly. These teachers were permitted to elaborate on their answers. This increased the number of responses to five.

The five respondents painted an informative picture regarding single-sex classes. It is evident that success can be achieved by using a mixture of different methods. It appeared the teachers preferred learning centers when available. Over all, using the mastery and guided instruction approaches was easier with boys, but the competition that arose could be detrimental as well as beneficial. Also, no one specific reading program was used across the board.

A majority of the respondents did not receive any formal training regarding brain-based instruction and how to teach single-sex classes. A strong need to have this training was apparent, but the ability for teachers to adapt without the training occurred. The general notion regarding these classes was that time of day may play a factor in success, and that the girls needed more directions when taken away from the boys.

Conclusions

The original intention for this study was to analyze whether single-sex education was a more effective structure for improving reading standardized test scores. Unfortunately, the results do not fully support this theory. In question one, students in single-sex classes outperformed those in coeducational classes in two of three cases. In case one, the mean difference was significant. In question two, similar results occurred. When learning gains are evaluated, students in single-sex classes were more successful in case two than in case three.

Two things are evident from these results. First, single-sex classes are not the best solution for every student. Although all but one student in case two made learning gains in the single-sex class, more than 80% made the gains in the coeducational class. The success could be proper student placement, but there is no proof that this is the case.

A multiple year study on the specific school may lead to more information regarding their success.

Secondly, in order for single-sex classrooms to be successful, it is imperative for school districts to train teachers on how to teach single-sex classes. It is evident from the responses to the questionnaire that a combination of presentation methods is crucial. Also, as with what prior research has suggested, it is important that the boys are allowed to move around and take a hands-on approach as opposed to direct instruction. If teachers are unaware of this, all that will exist is a classroom of all boys or all girls being taught the same way as a coeducational classroom and results will be unpredictable.

The questionnaire provided significant information regarding single-sex classrooms. Since the original intention was to investigate if similarities existed between single-sex and coeducational classrooms, it is unfortunate that no responses came from the coeducational teachers. Similarities in methods and beliefs did, however, exist with teachers of single-sex classes. It is important to note that four of the five teachers taught in the same school on the same team. Although this was the case, the teachers did differ on some beliefs especially on whether the competition within the all-boys classes was healthy or a distraction.

The results of this study showed that more research is needed to fine-tune the single-sex approach. Currently, it is evident that no one way exists regarding presentation methods and the structure of the classroom. If single-sex classrooms are to be successful, a program must be developed that teachers can follow regardless of the school. This program needs to include training for teachers, materials designed with gender consideration, and continuous support including professional development

regarding brain-based research. Programs such as AP and IB have data to support the importance of these components.

Finally, it is important to delineate between "Statistical significance" and "Educational significance." The learning gains in case two and case three showed no statistically significant difference; however, the learning gains in case two were above 80% in both classes and above 50% in both classes for case three. While the difference was not *statistically significant*, these numbers are still positive when looking at it from an educational stand point.

Recommendations

Findings from this study lead to the following recommendations regarding practice:

1. Offer single-sex classes as an option. The data showed that single-sex classrooms are not for everyone. If a school offers single-sex classes for the core subjects, the potential to help students who struggle will exist. This, of course, is contingent on teachers receiving training regarding single-sex classrooms.
2. Increase the amount of professional development regarding brain-based research. Whether they teach single-sex or coeducational classes, all teachers will benefit from knowing how their students learn. If teachers of single-sex classes are more conscious of this, it may help to increase results.
3. Train teachers and administrators on how teaching in single-sex classrooms differs from teaching in coeducational classrooms. Using what they learn regarding the brain will help, but understanding that a class of one gender is different from that of both genders is crucial. One of the keys to success is teaching to students by the means they learn the best. If the teacher has the

advantage of having all of one gender in the class, they must present the information in the manner that research has proven to be the most effective with the specific gender.

4. Give single-sex classrooms an opportunity to succeed. Throughout the research process, some schools indicated they no longer had single-sex classrooms after only one or two years of its inception. As with all new programs, single-sex classrooms need the opportunity to obtain success. This may take more than one or two years.
5. Create an instructional model for single-sex classrooms. This will give teachers of single-sex classrooms the basic ideas regarding the differences in how male and female students learn. It is important that the model is research based and data driven.

Findings from this study lead to the following recommendations regarding future research:

1. Develop a model of a successful candidate for a single-sex classroom. The data suggests only certain students will be successful in single-sex classrooms. It would be beneficial if characteristics of a student who would be successful in a single-sex setting could be identified so that proper placement into these classes would occur.
2. Increase the size of the study. The current study used roughly 50 boys in single-sex classrooms. Results may be more significant if scores from more students were used.

3. Conduct studies by state. If states contain more than one school with single-sex classrooms, the sample size will be larger as classes can be grouped together. This would provide lawmakers more valuable data to determine the program's worth.
4. Investigate if socioeconomics and race are a factor. Determine if single-sex classrooms would benefit specific populations. If success can be found without specifying for socio-economic background or race, continued research with consideration of these categories may show more instances of significance.
5. Investigate if single-sex classes would benefit students in the lowest quartile. *The No Child Left behind Act* has stressed the importance of focusing on students who are in the lowest quartile in both reading and math. By removing the distractions of the opposite gender and teaching to the gender using research-based techniques, students in this group may improve their chances of success.
6. Investigate if the gender of the teacher is a factor regarding success. If no significant difference occurred regarding the data from this study, it may be that the gender of the teacher has a demonstrable impact. In other words, does it matter if a male or female teaches a single-sex boy class?
7. Perform an investigation with female students that explores the influence of risk taking on the learning process. Assume risk taking is related to a student's confidence level – an aspect that has been identified in prior research to be a factor in reading success. This may be crucial as it is a topic brought up in the discussion with the single-sex teachers that had not surfaced in the review of past research.

8. Conduct multiple year studies in schools that show success. By conducting a multiple year study, information regarding the success of single-sex classes may become more evident.
9. Change the design of the questionnaire. Although the original intention of the survey was to see if similarities existed with single-sex and coeducational classes, it would have been more beneficial to see if these commonalities existed between single-sex teachers.

In the author's opinion, single-sex classrooms are most valuable when offered as a program. Such programs as the International Baccalaureate and Advanced Placement programs are successful because not all students are forced to participate in them. If single-sex classrooms are used similar to other options currently offered within the schools, the author believes the best results will be seen.

The author also believes that something must be done in order to help the reading crisis boys face in American public schools. The research has shown that single-sex classrooms can be a successful method in improving reading standardized test scores. It is now the responsibility of school systems to use single-sex classrooms and train teachers in the research-based methods of instruction for these classes. By doing this, schools will give boys the opportunity to learn in a method that brain-based research supports.

APPENDIX A: INITIAL E-MAIL TO SCHOOL PRINCIPALS

(Principal's Name)

My name is Eric Basilo. I am an Educational Leadership Doctoral student at the University of Central Florida as well as a dean of students at Winter Park High School in Winter Park, Florida. I am conducting research regarding schools that have single-sex classrooms. It would
be a lot of help if you could answer these questions for me so I can use your school district in my study. If you would not like to be part of the study, simply do not respond. If you would, I will send you a follow up e-mail to acquire data regarding state test scores.

Please include the name of the school and the answers.

1.) What grades contain single-sex classrooms?

2.) Do you have single-sex reading classes?

3.) Do you offer a single-sex reading class for both boys and girls?

4.) If so, do you also have coed reading classes for the same grade level?

5.) What year did you begin single gender classes in English/Reading?

Thank you again for taking the time to help me with my study.

Sincerely,

Eric Basilo
Doctoral Student
University of Central Florida

APPENDIX B: FOLLOW-UP E-MAIL REQUESTING DATA

(***Principal's Name***)

Thank you for taking the time and agreeing to help me with my study. There are only two more parts and I will be finished. The first part is the data. I need to acquire (***State test***) scores regarding last years (***Grade in school***) grade reading disaggregated by teacher (So I can compare the single-sex classes to the coeducational ones). Can you help me with this? (In Orange County, we would use Online Data Access (ODA).) I realize I may need to go through someone at the county to get this, just say who and I'm on it.

The final part is a questionnaire I am constructing for the teachers of this grade. I will administer it via e-mail to the teachers from last year. It will ask questions regarding the textbooks being used as well as the reading programs and methods of instruction. I would like your ok to accomplish this as well.

Thanks again for all of your help!

Sincerely,

Eric Basilo
The University of Central Florida

APPENDIX C: E-MAIL FOR QUESTIONNAIRE

E-Mail to Potential Participants

My name is Eric Basilo. I am a doctoral student at the University of Central Florida. I am conducting research regarding teaching styles in both single-sex and coeducational classrooms. You have been identified as teaching (grade) grade at (name of school) for the 2006-2007 through communication with (principal/designee name).

I am inviting you to complete the brief survey attached to this e-mail. It talks about your teaching methods as well as the tools you use to teach reading. I ask that you fill out the survey, attach it to an e-mail and return it by (one week from mailing). Once I have recorded your responses, I will store the e-mail on a password protected computer. Your name or e-mail address WILL NOT be used in the data analysis.

If you have any questions regarding the research or the questionnaire please e-mail or call myself or my advisor, Dr. Barbara Murray, at the contact information below.

Primary researcher: Eric Basilo – 407-925-9529 – ebasilo@cfl.rr.com
Advisor: Dr. Barbara Murray – 407-823-1473

Thank you in advance for helping me with this important research!

Sincerely,

Eric Basilo
University of Central Florida

APPENDIX D: QUESTIONNAIRE FOR READING PROGRAM SURVEY

Reading Program Survey

Eric Basilo
Doctoral Student
University of Central Florida

Directions: Answer each question by marking or typing the appropriate response.

START HERE

For Questions 1- 7, to what extent do you practice the following classroom strategies with regards to reading?

1. **Learning Centers**: Daily
   Please provide examples of how you use *Learning Centers*: _____

2. **Computer Based Learning (CBL)**: Daily
   Please provide examples of how you use *Computer Based Learning*: _____

3. **Guided Discovery (Involve students in testing new concepts)**: Daily
   Please provide examples of how you use *Guided Discovery*: _____

4. **Mastery (To get students to perform at their highest level)**: Daily
   Please provide examples of how you use *Mastery*: _____

5. **Expository (Direct Instruction)**: Daily
   Please provide examples of how you use *Expository*: _____

6. **Programmed Instruction (Provide immediate feedback and reinforce comprehension)**: Daily
   Please provide examples of how you use *Programmed Instruction*: _____

7. **Individualized Instruction**: Daily
   Please provide examples of how you use *Individualized Instruction*: _____

Please Continue on the Next Page

CONTINUE HERE

For questions 8 – 11, please answer all of the following questions.

8. Do you observe one delivery method to be more effective with boys? Learning Centers

Please explain your answer: _____

9. How many times have you attended professional development regarding brain-based instruction and how each gender learns?

☐ One ☐ Two ☐ Three ☐ Four ☐ Five or More

10. For the 2006-2007 school year, I taught in a _____ classroom.

☐ Single-Gender ☐ Coeducational

11. Please list the reading programs that you used for the 2006-2007 school year.

_____

12. Please list the reading textbook(s) used for the 2006-2007 school year.

_____

13. Is there a special method not listed that you feel works well with your students? _____

Please explain your answer: _____

Thank you for taking the time to complete this questionnaire. If you have any further suggestions or comments regarding reading programs or reading instruction, please provide them in the below:

_____

Reading Program Survey

Please return your completed questionnaire by following the instructions below:

1.) Fill in the form on your computer (do not print)
2.) Save it to your computer
3.) Attach it to an e-mail addressed to basiloe@ocps.net

APPENDIX E: IRB APPROVAL LETTERS

University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901, 407-882-2901 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Notice of Expedited Initial Review and Approval

From **:** **UCF Institutional Review Board**
FWA00000351, Exp. 5/07/10, IRB00001138

To : **Eric Basilo**

Date : **June 20, 2007**

IRB Number: **SBE-07-05037**

Study Title: **AN ANALYSIS OF READING PERFORMANCE OF MALE STUDENTS AND THE SINGLE-SEX CLASSROOM**

Dear Researcher:

Your research protocol noted above was approved by **expedited** review by the UCF IRB Vice-chair on 6/19/2007. **The expiration date is 6/18/2008.** Your study was determined to be minimal risk for human subjects and expeditable per federal regulations, 45 CFR 46.110. The category for which this study qualifies as expeditable research is as follows:

7. Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

All data must be retained in a locked file cabinet for a minimum of three years (six if HIPAA applies) past the completion of this research. Any links to the identification of participants should be maintained on a password-protected computer if electronic information is used. Additional requirements may be imposed by your funding agency, your department, or other entities. Access to data is limited to authorized individuals listed as key study personnel.

To continue this research beyond the expiration date, a Continuing Review Form must be submitted 2 – 4 weeks prior to the expiration date. Advise the IRB if you receive a subpoena for the release of this information, or if a breach of confidentiality occurs. Also report any unanticipated problems or serious adverse events (within 5 working days). Do not make changes to the protocol methodology or consent form before obtaining IRB approval. Changes can be submitted for IRB review using the Addendum/Modification Request Form. An Addendum/Modification Request Form **cannot** be used to extend the approval period of a study. All forms may be completed and submitted online at http://iris.research.ucf.edu .

Failure to provide a continuing review report could lead to study suspension, a loss of funding and/or publication possibilities, or reporting of noncompliance to sponsors or funding agencies. The IRB maintains the authority under 45 CFR 46.110(e) to observe or have a third party observe the consent process and the research.

On behalf of Tracy Dietz, Ph.D., UCF IRB Chair, this letter is signed by:

Signature applied by Joanne Muratori on 06/20/2007 09:47:00 AM EDT

IRB Coordinator

University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901, 407-882-2901 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Notice of Expedited Initial Review and Approval

From **:** **UCF Institutional Review Board**
FWA00000351, Exp. 5/07/10, IRB00001138

To : **Eric Basilo**

Date : **November 26, 2007**

IRB Number: **SBE-07-05322**

Study Title: **II - AN ANALYSIS OF READING PERFORMANCE OF MALE STUDENTS AND THE SINGLE-SEX CLASSROOM**

Dear Researcher:

Your research protocol noted above was approved by **expedited** review by the UCF IRB Chair on 11/16/2007. **The expiration date is 11/15/2008.** Your study was determined to be minimal risk for human subjects and expeditable per federal regulations, 45 CFR 46.110. The category for which this study qualifies as expeditable research is as follows:

> 7. Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

A **waiver of documentation of consent** has been approved for all subjects. Participants do not have to sign a consent form, but the IRB requires that you give participants a copy of the IRB-approved consent form, letter, information sheet, or statement of voluntary consent at the top of the survey.

All data, which may include signed consent form documents, must be retained in a locked file cabinet for a minimum of three years (six if HIPAA applies) past the completion of this research. Any links to the identification of participants should be maintained on a password-protected computer if electronic information is used. Additional requirements may be imposed by your funding agency, your department, or other entities. Access to data is limited to authorized individuals listed as key study personnel.

To continue this research beyond the expiration date, a Continuing Review Form must be submitted 2 – 4 weeks prior to the expiration date. Advise the IRB if you receive a subpoena for the release of this information, or if a breach of confidentiality occurs. Also report any unanticipated problems or serious adverse events (within 5 working days). Do not make changes to the protocol methodology or consent form before obtaining IRB approval. Changes can be submitted for IRB review using the Addendum/Modification Request Form. An Addendum/Modification Request Form **cannot** be used to extend the approval period of a study. All forms may be completed and submitted online at http://iris.research.ucf.edu .

Failure to provide a continuing review report could lead to study suspension, a loss of funding and/or publication possibilities, or reporting of noncompliance to sponsors or funding agencies. The IRB maintains the authority under 45 CFR 46.110(e) to observe or have a third party observe the consent process and the research.

On behalf of Tracy Dietz, Ph.D., UCF IRB Chair, this letter is signed by:

Signature applied by Janice Turchin on 11/26/2007 10:10:22 AM EST

IRB Coordinator

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